Dental Abstracts

a selection of world dental literature

AMERICAN DENTAL ASSOCIATION

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Infections of dental etiology in the mandibular and maxillofacial region

Daniel E. Waite, D.D.S., M.S., Iowa City, Iowa*

Swellings in or about the face have always proved difficult from the standpoint of proper diagnosis and treatment. Many facial infections receive a standard broad-spectrum antibiotic treatment, without regard for diagnosis or etiology. Throughout the world, in spite of great strides in the development of antibiotics—and to some extent because of this—there still remains an important problem of proper diagnosis and treatment of infection in and about the face.[1]

One of the first requirements is the complete understanding of the anatomical structures involved, and no one should be more familiar with the anatomy of the face and, more specifically, the mouth, and related structures, than the dentist. There is by no means a single, simple explanation of the anatomical considerations of infections throughout the head and neck.

The potential areas where infection may localize are determined by the fascial spaces. Fascial spaces are potential areas between planes of fascia.[2] When the loose connective tissue which normally binds fascial planes together is destroyed by invading infection, the intervals thus established between the planes are referred to as fascial spaces.[3] The fascial spaces will be mentioned and their location identified by drawings.

The space of the body of the mandible is a space created by fusion of muscular fascial layers with the mucoperiosteum of the alveolus of the mandible. Infections tend to remain localized in this space; however, as Bell[2] has indicated, they may permeate other areas. First, they may enter the oral cavity through the free mucous membrane overlying the alveolar portion of the bone on either the buccal or the lingual side. They may travel to the outside of the face by penetrating the periosteal covering of the mandible (Fig. 1). A third possibility is that the infection may pass posteriorly to the masticator space. Infections also may spread to the floor of the mouth if the apexes of the teeth involved lie above the mylohyoid muscle attachment, as is usually the case with incisors, cuspids and bicuspids, or into the submaxillary space if the teeth are below the mylohyoid muscle, as may occur with bicuspids and molars (Fig. 2).

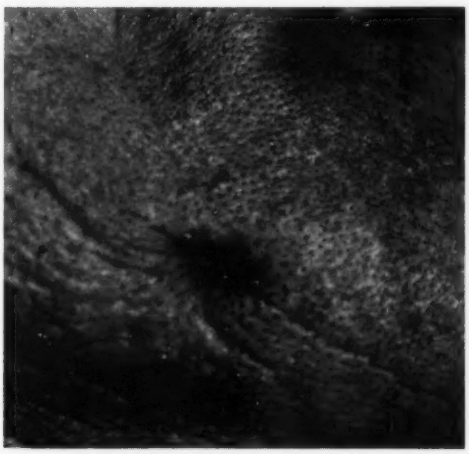


Figure 1 Draining sinus tract from first molar

The limits of the space of the body of the mandible are generally accepted to be from the symphysis of the mandible to and including the third molar. Infections in this region often are drained adequately by incisions within the mouth on the buccal aspect of the mandible in the depth of the mucobuccal fold (Fig. 3). Extraoral incision and drainage can be resorted to when necessary by making an incision through the skin and subcutaneous tissue and periosteum, beneath and par-

An understanding of the anatomy of the tissues involved is a prerequisite to the diagnosis and treatment of dental infections. The regions where infection may localize are determined by the fascial spaces. For optimum treatment, the offending microorganisms and the antibiotics to which they are sensitive should be identified.

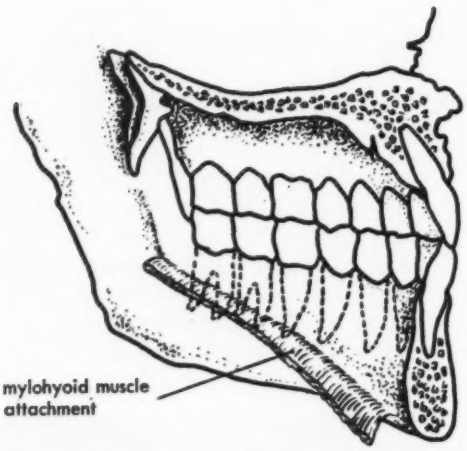


Figure 2 Lingual view showing relationship of apexes of teeth to mylohyoid muscle attachment

allel to the inferior border of the mandible (Fig. 4).

The masticator space is determined by the continuation of the same fascial layers as the space of the body of the mandible. This space is frequently subdivided into the superficial and deep temporal spaces. Its contents are essentially the ramus of the mandible and the muscles of mastication, that is, the masseter muscle, pterygoid muscles and the temporal muscle.

Infections of this space usually occur through extension from the space of the body of the mandible, parotid space or lateral pharyngeal space, suppurative middle ear disease, septic material on the needle in mandibular injections and from osteomyelitis of the zygomatic or temporal bones.[4] Postoperative infection after surgery involving the ascending border of the ramus, as in operations for the removal of lower third molars, also could involve the space.

Intraoral drainage of this space can be accomplished by an incision parallel with the anterior border of the masseter muscle; however, special concern has to be given to the location of Stensen's duct. Extraorally, an incision can be made below and behind the angle of the mandible, allowing good exploration of the medial and lateral aspects of the mandible (Fig. 5 and 6).

The usual symptoms of infection are evident: pain, swelling, increase in temperature and pulse, and so forth. Additionally, trismus is frequently noted when this space is involved.

The lateral pharyngeal space is a visceral vascular space rather than a muscular fascial space,[1] the main difference being that here the fascia covers viscera instead of muscle and allows for more rapid dissemination of the infection. This space lies medial to the ramus and actually includes the pharyngeal tissues. It also has been referred to as the pharyngomaxillary space. The boundaries of this space are such that infections may extend to the base of the skull superiorly and into the chest inferiorly.

Extension of infection into this space may occur from the tonsils, floor of the mouth, space of the body of the mandible, and the masticator space.

Symptoms for involvement of this space are the same as for all others in regard to the systemic reaction to infection with the addition of some local factors. Here fluctuation is not easily detected since palpation is difficult. Dysphagia is a constant symptom, and the patient talks with a characteristic garbled and indistinct sound in advanced stages of the infection.

Incision and drainage is best accomplished intraorally through the lateral pharyngeal wall with the patient under a general anesthetic (Fig. 7).

Infections involving the anterior triangle of the face are those occurring at the base of the lip, and from the canine fossa (Fig. 8). These can be serious infections because of the venous drainage of this region. The infection in such

Figure 3 Intraoral incision and drainage of space of body of mandible (rubber drain sutured in place)

instances disseminates from the superior labial venous plexus into the facial vein, and may find entrance into the cranium through the angular vein to the superior ophthalmic vein and into the cavernous sinus.[5]

The usual etiological factor here is infection from the apexes of the anterior teeth. Incision and drainage of infections involving the base of the upper lip or the canine fossa are best accomplished intraorally in the depth of the mucobuccal fold of the region involved.

The parotid space has been mentioned but not described, since relatively few infections of dental etiology reach this space.

After a thorough understanding of the anatomy of the tissues involved, the clinician will be able to treat his patient with confidence and observe more capably the progress of the infectious process.

Treatment of Acute Infections

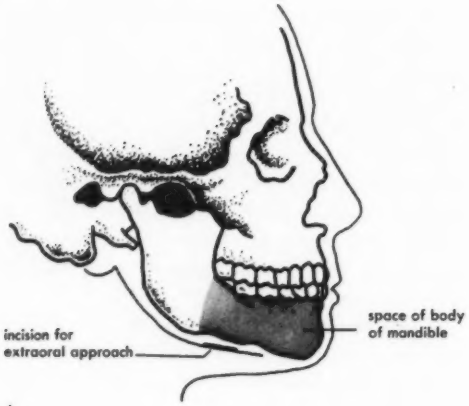
For the successful treatment of acute oral infections, the following outline[6] can be used as a guide:

1. The bacteria are combated with chemotherapy.
2. The tissues are treated by:
    a. Incision and drainage.
    b. Removal of diseased teeth and necrotic bone.
3. Supportive therapy.
    a. Rest.
    b. Fluids.
    c. Nourishment.
    d. Analgesics.
    e. Physical therapy.

A complete discussion of the bacteria involved in oral infection and the proper choice of antibiotic would require an extensive study; however, it should be noted that proper identification of the bacteria prior to selection of the antibiotic is desirable. This is not always possible since time is a factor in treatment and at least 48 hours is necessary for this process. It is a simple matter to obtain the material for a culture by using a sterile swab to contact a small amount of the pus or exudate and submitting it to the bacteriologist. A request should be made for (1) identification of the organism, and (2) the antibiotics to which it is sensitive. There are several other points which are helpful in clinically making this evaluation, such as a knowledge that the great majority of oral infections are caused by the staphylococcus and streptococcus organisms. The nature of the exudate and the apparent ability of the infection to spread is also helpful to the clinician in making a diagnosis. The patient's systemic reaction is frequently an indication as to the virulence of the organism.

A decision about the proper choice of antibiotic has now become a grave and somewhat complicated procedure partially because of past indiscriminate use of antibiotics. Some patients now are sensitive to many of the present antibiotics; such sensitivity has caused serious illness, even death. Another complication is the resistance of microorganisms to various antibiotics; such resistance can be determined only by the taking of a good history. As a rule of thumb, it is the author's opinion that antibiotics should not be resorted to for every little flare-up, but the patient should be given an opportunity to build his own resistance and the antibiotics reserved for more serious infections.

Treatment of the tissues most certainly must not be over-looked. It is not uncommon to see the patient who has been treated with antibiotics for several days, with no local treatment, ultimately having no improvement. In this instance, the antibiotic has served only to "mask" the infection and allow the microorganisms to become more resistant. In such instances incision and drainage are important adjuncts to treatment. This form of therapy can be carried out only with a proper understanding of the anatomy involved. Dependent drainage and the use of rubber drains to keep the tissues open for drainage are procedures often neglected (Fig. 9). When incising for drainage, it is important to know when the time is "right," which is best determined if the infection is fluctuant. The incision should be made to bone and through the periosteum. A blunt instrument or hemostat should be inserted and the tissues spread to create accurate drainage. It should be remembered, however, that minimal tissue manipulation is a cardinal principle in the treatment of acute infection.



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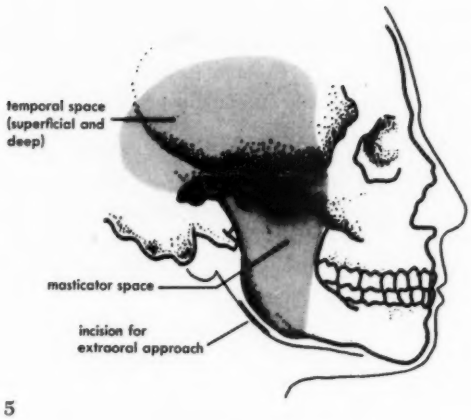

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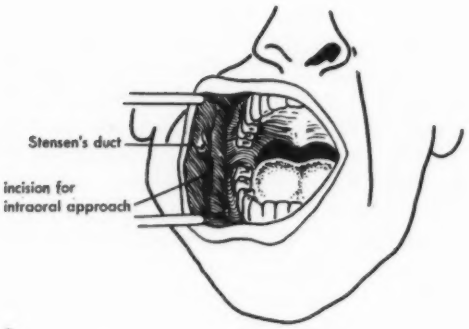

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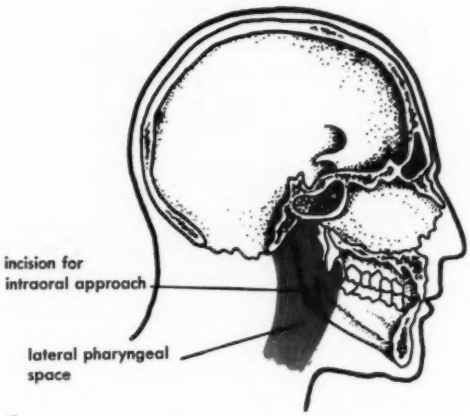

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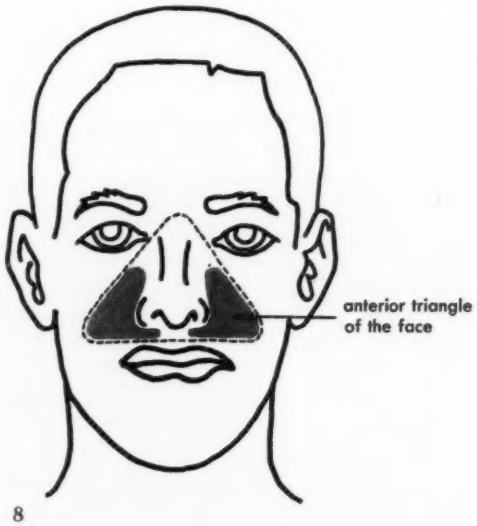

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Figure 4 Space of body of mandible and extraoral incision and drainage

Figure 5 Masticator and temporal spaces and area for extraoral drainage

Figure 6 Intraoral view showing point for incision and drainage of masticator space

Figure 7 Intraoral view of lateral pharyngeal space and area for drainage

Figure 8 Anterior triangle of face

The removal of diseased teeth and necrotic bone is an important factor for concern, and fortunately is usually recognized as such by the dentist. There is, however, a difference of opinion as to the proper time for removal of the involved tooth during an acute infection. There are those who believe that a tooth is never too "hot" to extract. However, extraction in such instances is an insult to the involved tissues and may open new routes for the infection to spread, especially to the medullary portion of bone. A proper sequence of treatment would be to provide adequate drainage of the infected tissue and remove the tooth when the infection is controlled.

The resistance of the patient cannot be overlooked, and its importance increases with the severity and duration of the infection. Adequate rest is frequently disregarded as an important requisite in the supportive therapy of infection. It is unfortunate that the patient's attitude is frequently one of unconcern when he has a swollen face as a result of "only an ulcerated tooth," whereas he may be quite alarmed about a headache or sore throat. Increased fluid intake is important from the standpoint of proper hydration and the control of body temperature. The dilution factor and the turnover of body fluids are also important considerations.

The diet during infection should not be neglected, as it definitely has an influence on the incidence, course, and final outcome of the infectious process.[7] Depending on the location of the infection and the ability of the patient to masticate, a liquid or soft diet may be indicated. Analgesics may be necessary for the control of pain and temperature. By careful selection of these drugs, a patient may remain comfortable and ambulatory during the surgical and postoperative period.

Physical therapy is important in the various facets of infection control. The toxic substances produced by infectious processes will frequently cause facial muscles to go into spasm and cause trismus. By careful exercising of these muscles or massage, this can be avoided. However, any mechanical pressures to involved tissues prior to incision and drainage can contribute to the direct spread of the infection. Hydrotherapy is a valuable aid in the localizing of infection and during the post infection healing period. The

Figure 9 Incision and drainage at base of upper lip for involvement of anterior triangle of face (rubber dam drain not shown)

proper use of heat and cold seems to be misinterpreted constantly. In general, it can be said that cold is used only in the minimizing of immediate post-surgical trauma and heat is used in the treatment of infection. Heat properly used intraorally or extraorally will substantially speed up the localizing of infection. Moist heat seems to be better than dry heat. Conversely, cold will retard the infectious process. After surgical intervention, heat also can be used effectively. The capillaries are dilated, creating a constant change between the removal of the accumulating toxic materials and the nutrient supply to the tissues. Basically, heat increases the metabolic process of the part involved, as does the increase of the patient's temperature.

A frequent complication in the treatment of oral infections is that of satisfactory anesthesia. If local anesthesia can be obtained without injecting into inflamed tissues, it is usually satisfactory to proceed with incision and drainage. Otherwise, general anesthesia can be considered.

* Department of oral surgery, State University of Iowa College of Dentistry.

Reprinted from the Journal of Oral Surgery, Anesthesia and Hospital Dental Service 18:412 July 1960.

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Orthodontics

A unique technique for correction of muscular dysfunction associated with malocclusion

Arthur Raeder. *New York State D.J.*
26:349-361 Oct. 1960

As a means of establishing normal function in abnormally functioning muscles associated with malocclusion, a "myolator" was developed to massage the muscles. The instrument combines the principles of massage with those of electrotherapy and metallotherapy. The myolator consisting of a lacing of metal coils is placed over the patient's head, attached to a motor, and activated. The lacing is designed so that each coil can be positioned to ride the patient's skin immediately over one of the dysfunctioning muscles at the point where the nerve enters the muscle, that is, at the motor end-plate or neuromuscular junction.

The coils press against the skin just firmly enough to prevent slipping. The coil pulls the skin with it each time the coil is pulled by the motor. As the coils are alternately stretched and freed to contract, they are pulled around in an elliptical course. Thus, they produce an intermittent, rhythmic, rotational pressure on the skin, stimulating the muscle to contract and thereby improving muscle tonicity.

The myolator was used as adjunctive therapy in the routine management of 89 orthodontic patients and as the sole therapy for another 26 orthodontic patients. Treatment with the myolator was recommended whenever muscle dysfunction could not be corrected readily by the elimination of a habit or by simple exercise. Treatment was continued until the muscles, on palpation, exhibited normal tone and no longer opposed the occlusal correction which was sought. Guided by clinical judgment, treatments with the myolator were administered one or more times a week for one month, or until clinical response (no matter how slight) was sustained for at least one week. Then the treatments were given twice a month for several months or until the muscles were restored to normal function and balance. Thereafter, the treatments were given once every four to eight weeks or even longer, until the patient was dismissed.

Treatment with the myolator produced the following effects:

1. A depressed and slightly erythematous area appeared beneath the coils.

2. The dysfunctioning muscles were restored to normal or nearly normal tonus.

3. The treated area became numb.

4. The patient felt completely relaxed and often felt sleepy.

Among the habits which disappeared most frequently after treatment with the myolator were mouth breathing, tongue thrusting, lip biting, lip sucking, lisping and tics. The numbness which persisted after treatment was responsible for these beneficial effects because it changed the sensation. The habit of resting the head on the hand while studying was the only abnormal habit which did not disappear after treatment had established normal muscle tonus.

Several case reports, illustrated with photographs and electromyograms, show the results of treatment.

Treatment with the myolator provides control over dysfunctioning muscles and relieves the orthodontist of dependence on the patient. The apparatus induces functionally and esthetically satisfactory results in instances where the prognosis is unfavorable because of muscle dysfunction. The myolator is useful in the management of most orthodontic problems where muscular dysfunction is a contributing factor. Use of the instrument reduces the force required to achieve tooth movement in mechanotherapy because the myolator eliminates interference by dysfunctioning muscles. Treatment with the myolator enables the orthodontist to use the patient's muscles as a cooperative, living orthodontic appliance. The beneficial effect of treatment with the myolator is both immediate and permanent as demonstrated by electromyographic changes.

615 Eastern Parkway, Brooklyn 16, N.Y.

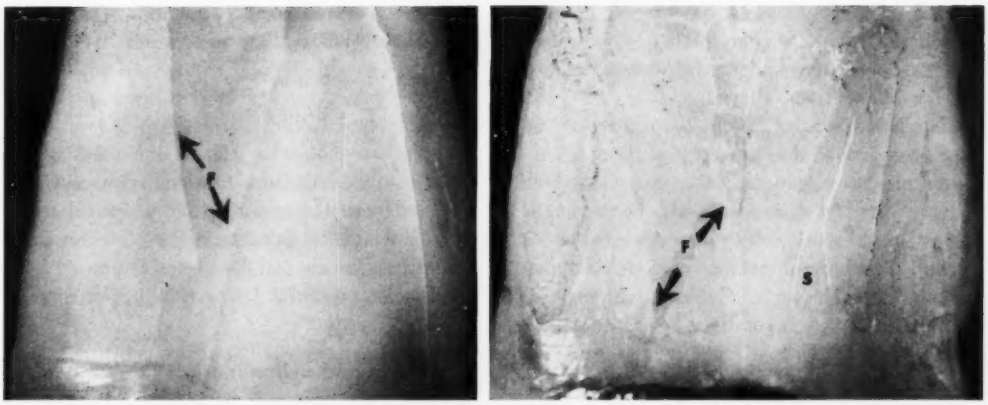


Figure 1 (Left) Root planed with a curet. Fissures (F) from other causes than use of the instrument are present, but the root is not scratched. Figure 2 (Right) Root planed with a hoe. Fissures (F) from causes other than instrumentation are present and so are scratches (S)

Periodontics

Subgingival root planing: a comparison using files, hoes and curettes

Jerry E. Barnes and Erwin M. Schaffer.
J. Periodont. 31:300-303 Sept. 1960

This study was undertaken to determine which of three types of periodontal instruments are best for removing calculus and obtaining the smoothest root surface. The material consisted of 90 teeth to be extracted for prosthetic and restorative reasons. Before extraction, depths of the gingival sulci were measured and recorded. Subgingival root planing was performed by the student operator until he felt that the root surface was free of calculus—smooth and hard. Three basic instruments were employed—curets, files and hoes. Tooth no. 1 was planed by curets only, tooth no. 2 by files only, tooth no. 3 by hoes only, tooth no. 4 by curets only, and so forth. All teeth were extracted later, examined macroscopically and microscopically and graded for smoothness of surface and for efficiency of instruments used.

A root planed with a curet is shown in Figure 1, a root planed with a hoe in Figure 2.

The following conclusions were drawn:

1. The smoothest root surfaces on both anterior and posterior teeth are obtained with curets. The roughest root surfaces are obtained with files.

2. Curets and hoes are most efficient in removing calculus, and files are least efficient.

3. When calculus remained after subgingival planing, it was found most frequently on either the mesial or distal surface of teeth. The surfaces most frequently devoid of calculus were the line angles mesial and distal to the labial and buccal surfaces.

School of Dentistry, University of Minnesota, Minneapolis 14, Minn.

Classification and nomenclature of periodontics as used in Bulgarian dentistry

H. Nossek. *Deut.Stomat.* 10:765-768 Oct. 1960

Influenced by the Russian vocabulary of dentistry, Bulgarian periodontists have developed a unique classification and nomenclature which, however, appears to be based more on the clinical aspects of periodontal disease than on morphologic findings.

In Bulgarian dental literature, the term periodontium has been replaced by "amphodont,"

derived from the Greek words *amphi* meaning around and *odous* meaning tooth.

Diseases of the amphodont (periodontal disease) are classified as follows:

Class I. Inflammatory processes of the gingivae have been divided into three groups. Group 1 includes exudative gingival inflammations which are subdivided into (a) serous, (b) hemorrhagic, and (c) purulent tissue responses to infection or trauma. Group 2, alterative gingival inflammations, is subdivided into (a) ulcerative gingivitis and (b) neurotic gingivitis. Group 3 includes proliferating gingivitis.

Class II. Inflammatory processes involving the entire amphodont (amphodontoses inflammata) are divided into (1) amphodontosis hemorrhagica, (2) amphodontosis pyorrhoica, and (3) amphodontosis mixta.

Class III. Atrophodystrophic processes of the amphodont.

Class IV. Neoplastic processes of the amphodont, divided into (1) elephantiasis gingivae (macrogingivae), (2) epulis, and (3) benign and malignant tumors originating in the amphodont.

The different forms of stomatitis are classified as follows:

Class I. Genuine stomatitis. Class I is divided into two groups: Group 1, superficial inflammations of the oral mucosa involving the buccal and labial mucous membranes, the palate, the tongue, the floor of the mouth and the gingivae, subdivided into (a) catharrhal stomatitis, (b) aphthous stomatitis, (c) decubitus ulcers, and (d) thrush. Group 2, deep stomatitis, is subdivided into (a) ulceromembranous stomatitis, (b) noma (gangrenous stomatitis), (c) hypertrophic stomatitis, and (d) idiopathic gingival hypertrophy (elephantiasis telangiectodes gingivae).

Class II. Symptomatic stomatitis, divided into (1) infectious stomatitis, (2) metabolic stomatitis, (3) endocrinous stomatitis, and (4) circulatory stomatitis.

Class III. Dermatostomatitis (ectodermosis erosiva pluriorificialis), and stomatosis.

Class IV. Specific stomatitis (associated with infectious diseases such as foot-and-mouth disease, gonorrhea, syphilis or tuberculosis).

Class V. Nonspecific stomatitis (associated with menstruation, diabetes or uremia).

Class VI. Glossitis.

Class VII. Cheilitis.

This new Bulgarian classification and terminology of periodontics, however, does not correspond with the scientific and technical terms used in the dental literature of the West European countries, Canada and the United States.

Fetscherstrasse 74, Dresden A 16, Germany

Plumbism and avitaminosis as probable causes of periodontal disease: report of two cases

René Fatzer. *Parodontol.,Zürich* 14:103-107 Sept. 1960

Chronic and suppurative inflammations of the periodontal tissues may be caused by plumbism or avitaminosis. The chronic characteristics, leading to degenerative disturbances of the periodontium, may result from either an absorption of lead or one of its salts or from a deficiency of vitamins (mainly vitamin C) in the diet.

Case 1. A 45 year old truck driver was referred to the author by a physician for diagnosis and treatment of inflammatory suppurating lesions in the gingivae, periodontal membrane and the mucosa covering the alveolar bone. Oral examination revealed that the gingival tissue was bright red, inflamed and swollen. Hemorrhages and suppuration occurred occasionally in all periodontal tissues. There were deep periodontal pockets filled with dark yellow pus, and the teeth showed a slight mobility.

The patient's history revealed that he had sustained a fracture of his right hand about one year previously. After splinting and penicillin administration, healing occurred uneventfully. The physician had hoped that penicillin would also be successful in eliminating the pain, infection and inflammation which had developed in the oral cavity. However, there was no improvement. Numerous fistulas and abscesses arose at the alveolar process, discharging whitish, thinly liquid pus.

The patient's occupation led to the suspicion that he had been exposed to vapors containing lead or tetraethyl lead, often used as an antiknock

agent in fuels for combustion motors. The associated symptoms such as facial spasms, headache, intestinal pain, fatigue, emotional instability, insomnia and referred pain (stomach, joints and back) seemed sufficient evidence for the presence of plumbism.

Without initiation of periodontal treatment, the causative factor (lead poisoning) was eliminated by injections of calcium ethylenediaminetetraacetate. After ten injections the symptoms of plumbism disappeared together with the periodontal symptoms.

The trucking company now uses gasoline free of lead salts, and there has been no recurrence of either symptom.

In the determination of the possible causative factors of periodontal disease, plumbism should be considered.

Case 2. A 35 year old Italian bricklayer complained about inflammation of the gingival tissue, swellings of the oral mucosa, ulcerative lesions of the periodontal tissue and extreme pain in both jaws. According to the patient, the pain had started six months previously and became so sharp and darting that mastication of food was impossible.

At first there was suspicion of a specific infection (ulceromembranous stomatitis) because of the presence of painful, enlarged lymph nodes. The periodontal lesions, however, were not suppurating.

The patient's diet consisted of potatoes and spaghetti, occasionally of meat (in the form of sausage), but was almost free of fresh vegetables.

The oral symptoms—swollen, maroon-colored and spongy gingivae, covering the main part of the tooth surfaces; hemorrhages; patechiae and discolored patches on the palate and inner aspects of the cheeks; the extremely pale lips and hemarthosis into the temporomandibular joint—led to the diagnosis of avitaminosis C (scurvy).

Treatment consisted in oral administration of 0.5 Gm. ascorbic acid four times daily. Altogether the patient received 20 tablets, each containing 0.5 Gm. ascorbic acid. The diet was enriched by adding citrus fruits, tomatoes, green peppers, strawberries and fresh green vegetables.

The oral lesions were treated (cleansed) with a spray containing carbohydrase (Carbozon). Improvement was quick and significant. The ulcerative lesions healed and regained a healthy color. The extreme pain subsided gradually.

Prior to periodontal treatment, it is advisable to determine whether the patient suffers from scurvy or from a deficiency of several organic substances—calcium, phosphorus, vitamin B complex (especially B_{12}), and vitamin C.

Zugerstrasse 45, Wädenswil, Switzerland.

Operative dentistry

The development and application of modern methods in cavity preparation: Part IX. The materials and design of cutting points

G. A. Morrant and R. R. Stephens. *Brit.D.J.* 109:334-339 Nov. 1, 1960

The dentist now has a range of cutting points and the means of applying them which enable him to prepare a tooth in any clinical form with a degree of ease hitherto hardly imagined.

It was not until the introduction of the foot engine and handpiece in 1872 that the range of rotary tools as known today began to develop. The various types of burs for cavity preparation then produced were file-cut by hand. The S. S. White Dental Manufacturing Company asserts that its Revelation bur introduced in 1891 was the first machine-made bur (Fig. 1); its most distinguishing feature was that one of the blades was continuous across the pole to form a penetrating edge which enabled the bur to cut more effectively in the direction of its axis. By the turn of the century the range of steel burs as available today had largely been established.

Figure 1 Rose-head steel bur showing single blade passing over tip for ease of penetration

Corundum disks or knife-edge stones for separating were introduced in the early 1870's, and from about 1900 the corundum, held in a vitrified binder, was incorporated in cutting points. Silicon carbide, discovered in 1891, later was applied to the manufacture of stones, disks and wheels.

Diamond burs were mentioned in an 1878 dental trade journal published in Berlin, and diamond disks, wheels and "polishing points" were listed in the Ash catalog of 1886, but were not advertised in the British edition until 1898. A number of sizes were available in round, bud and fissure shapes. These early diamond instruments were manufactured by hammering diamond grains into a soft metal core (usually copper, although soft iron was used for disks). These diamond-charged instruments had a comparatively short life because of the ease with which the diamond grains could be dislodged. With improvements in the manufacture of steel burs, it appears that in the 1920's the production of diamond instruments ceased in England, and little further interest was taken in them until the late 1930's; tooth grinding and bulk removal of tissue in crown preparation normally was achieved by abrasive disks and stones.

Drendle and Zweiling of Berlin claim to have invented the modern diamond abrasive instrument in 1932. Presumably it was at this time that the method of holding the diamond grains to a core by an electrodeposited bond of metal was introduced. Diamond instruments were beginning to regain favor in Europe before World War II; the European instruments led those produced in the United States both in quality and degree of use. After the war, the use of diamond instruments began to increase enormously, and this trend was given impetus by the employment of higher speeds. A combination of diamond, water spray coolant and high speed produced excellent results, whereas the steel bur rapidly blunted. The wider use of diamond instruments has been further stimulated by the manufacture of many special patterns. With ultra-high-speed handpieces, the speed, low pressure required, and the reduction in vibration produced by the hand-

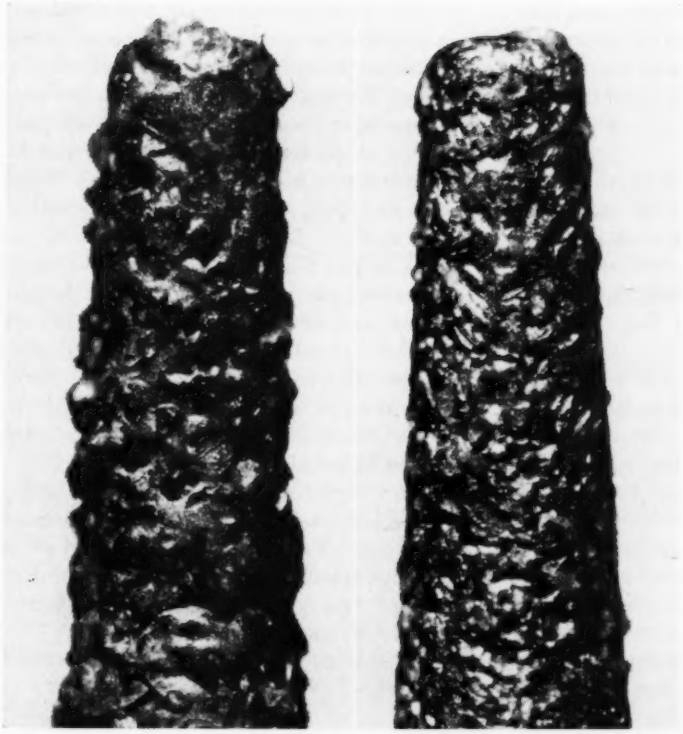


Figure 2 Diamond points of similar size. Left: Coarse-grained for grinding at conventional speeds. Right: Fine-grained for ultra-high-speed handpieces

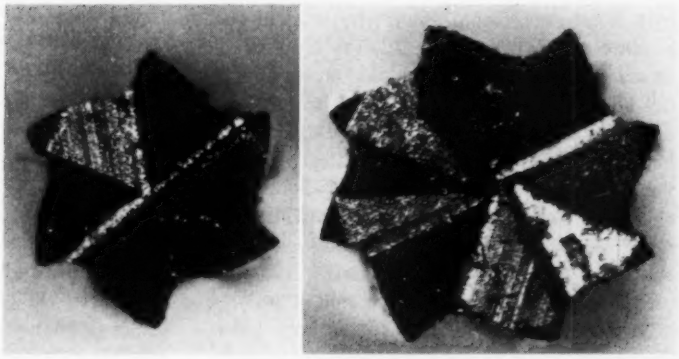
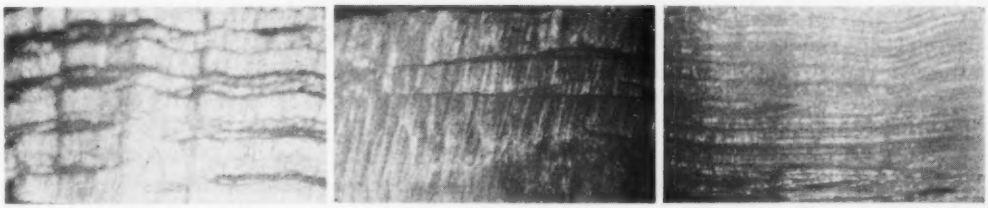


Figure 3 Friction grip ultra-high-speed tungsten-carbide fissure burs. Small sizes have six blades (left) whereas there has been a reversion to eight blades for the larger sizes (right)

Figure 4 Appearance of enamel after ultra-high-speed cutting. Left: Ridges in line of cut produced by crosscut fissure bur. Center: Smoother surface from plain cut fissure bur. Score marks have resulted from the tip of the flat bur. Right: Uniform scored surface from diamond point



piece, have permitted use of a very fine grain size, which has been adopted by most manufacturers of diamond instruments in Europe. The friction grip diamond cutting points (Fig. 2) all are small in size and do not exhibit the same diversity of design as the standard ranges.

The modern abrasive stone is largely silicon carbide, a substance approaching diamond in the hardness scale. It is bonded with a mineral compound which, when fused, becomes completely vitrified, but since it wears relatively rapidly, any sharp contours are soon blunted, thus restricting its further use in the precise preparation of the tooth. Although carborundum points cut tooth tissue effectively at ultra-high speeds, these stones do not appear to have a place in ultra-high-speed technics since they break and wear out easily.

Formerly, it was generally accepted that the steel bur was an inefficient instrument for removing hard tooth structure, and attempts were made to find a better material than steel for bur construction. The first tungsten-carbide burs were marketed in Sweden and the United States in 1949, and in England in 1950. Tungsten-carbide is nearly as hard as diamond, but it is brittle, necessitating a modification in the conventional bur design. Because of the brittleness and the cost of tungsten-carbide, only the head of the bur is formed in this material, the head being attached to the shank by welding or brazing.

Under clinical conditions tungsten-carbide burs cut more efficiently than steel burs, particularly in hard enamel, and maintain their edge longer than do steel burs. Also, tungsten-carbide burs are efficient at increased speeds and their introduction extended the possibilities of high-speed operating, which had been introduced in order to use diamonds to the fullest advantage.

Modifications in bur design have been introduced producing a range of friction grip tungsten-carbide burs for ultra-high-speed operation. It is said that cutting performance is improved if eight blades are used. With the smaller size burs, however, the six blade design is retained (Fig. 3). Trials of burs with as few as three blades show extremely effective cutting which may be even more rapid than with the eight blade bur, although with fewer burs there is a tendency to greater vibration.

Another development has been the return to the very old design of plain cut burs, which produces a smoother surface at ultra-high speed than do crosscut fissure burs. Ultra-high speed also has reduced the need for burs of larger diameter.

There have been innovations in bur patterns; the pear shape, for many years familiar as a finishing bur, now is used as a bur to prepare cavities both in long and short form. Stress analysis indicates that a flat floor and sharp internal line angles, so long recommended by dental teachers everywhere, are not only unnecessary but are contraindicated for amalgam restorations at least. Rounded internal angles can be produced easily by pear-shaped burs while extension is being made; much the same result can be achieved with the new domed-head fissure burs, which also can be used for initial penetration.

Today the choice of diamond or tungsten-carbide bur seems largely a matter of personal preference. Certainly, all the implications of ultra-high-speed cutting have not yet been fully explored, and further developments in cutting point design may be anticipated.

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Analysis of pain incidence during dental operative procedures with rotating instruments at intermediate and high speeds

Fred Herzberg and Benjamin Engel.
J.South.California D.A. 28:388-396 Dec. 1960

The reaction of patients to dental operative procedures with rotary instruments operating at 50,000 rpm and at 250,000 to 300,000 rpm was evaluated clinically. Carbide burs and diamond stones were used. A water spray was delivered to the operative site. No anesthetics were used. The patient's reaction was recorded either as NP (no pain), P (pain) or M (moderate pain). The results were compared with those reported by other authors for operative procedures at lower speeds.

Sex of the patient, time of day of the dental procedure and condition of the tooth before operation had little, if any, bearing on the pain reaction of the patient.

Operative procedures at 50,000 rpm elicited more "pain" reactions and fewer "no pain" re-

actions than operative procedures at low and conventional speeds, reported by other authors.

Operative procedures at 250,000 to 300,000 rpm elicited more "pain" reactions and fewer "no pain" reactions than procedures at 50,000 rpm or at low speeds.

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Corrosion in dental amalgam restorations

Joseph Rubinstein. *Illinois D.J.* 29:817-819 Dec. 1960

The galvanic action which occurs in the mouth is accompanied by a chemical reaction which leads to a deterioration and loss of material—the phenomenon called corrosion. Of the varieties of corrosion, the type most frequently encountered is electrochemical corrosion, in which two reactions occur, one at the anode and one at the cathode. Anodic reactions are primarily oxidations, and are accompanied by a destruction of the anode metal. The reactions at the cathode are based on reduction, which does not affect the cathode metal. In the corrosion process, the electrons flow from the anode to the cathode.

When two different metals form a part of a galvanic cell—such as gold and amalgam form in the mouth—the less noble of the two metals shows gradual destruction due to corrosion.

A single restoration in the mouth also can create corrosion. There are two explanations for this:

1. Small anodic and cathodic regions form in the metal as a result of inhomogeneities in the metal caused by impurities, additional phases, or variations in grain size.

2. A metal in contact with saliva of different compositions in various areas, or in contact with saliva and pulpal fluid, which are in contact with each other, will develop a small current. The corrosion is created because of differences in the solute concentration, the bacteria count, the temperature or the degree of aeration.

Little corrosion is found in an amalgam made up of small particles, because of the homogeneous structure of the alloy.

Corrosion occurs more frequently in hidden areas and places where deposits prevent access to oxygen. The fact that tarnish on amalgam fillings occurs more often in hidden areas than on self-cleansing surfaces (Schoonover and Souder, 1941) can be traced to a restriction of the oxygen supply to the interproximal spaces.

Corrosion plays a part in the delayed expansion of amalgam containing zinc, which will occur if the amalgam is contaminated during trituration or condensation.

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Oral galvanism

F. Eintracht. *J.D.A.South Africa* 15:358-363 Nov. 1960

Pain associated with oral galvanism is not uncommon, particularly after recent restorative procedures involving the use of dissimilar metals in the oral cavity. In the mouth, four types of galvanic cells are possible: those with intervening, intermittent, or constant contact, and a solitary amalgam restoration in contact with the electrolyte—saliva and tissue fluid.

Controlling factors in the production of this type of pain are: (1) pathway of the current, (2) production of voltage, (3) production of a current, (4) polarization, and (5) the pain threshold of the patient and of different teeth.

Galvanic reactions have been observed in the oral cavity only in connection with recently placed amalgam restorations, which may be either solitary in the oral cavity or in repeated contact with other metal restorations. The reactions caused by the formation of an electric couple, resulting from a gold inlay in contact with an amalgam filling, seem to be the most offensive.

In vitro investigations indicate that zinc oxide linings provide greater insulation than zinc phosphate linings, to minimize the pain from oral galvanism.

Relief from this type of pain can be obtained by painting the cavity walls and the completed restoration with a dental varnish. The varnish interrupts the circuit.

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Oral surgery

Cancellous bone grafts in treatment of chronic osteomyelitis, skull defects and mandibular fractures

H. J. Thörmer and K. A. Weber. *Arch.klin.Chir.* 290:564-578 Aug. 1960

Pathologic changes occurring in chronic osteomyelitis can be treated successfully by transplanting cancellous bone grafts. Previously, treatment consisted of removal of the sequestrums because it was assumed that the regenerative power of compact bone cannot be sufficient to provide spontaneous repair because of the impaired circulation. However, the cavities remaining after surgical removal of dead and detached bone (whether primary, secondary or tertiary sequestrums) usually are filled with chronic granulation tissue, thereby often becoming foci of infection.

In the past, healthy muscle tissue or bone chips have been used to fill the cavity after sequestrectomy to stimulate bone regeneration.

During World War II, satisfactory results were reported with the use of cancellous bone grafts in the treatment of infected skull defects and fractures of the lower jaw. It was demonstrated that the regenerative power of the spongy substance of bone is much greater than that of the compact substance. The cells of the spongy substance are less differentiated. The surface of the spongiosa is increased, permitting rapid revasculation from the surrounding tissue, thereby avoiding postoperative necrosis.

The authors have used cancellous bone grafts primarily in bones where muscle tissue was not available to fill the postoperative cavity or in instances in which the defect was too large to be covered completely by healthy muscle transplants.

The cancellous bone was obtained from the trochanter or the ileum, and the entire cavity was filled with the spongy bone graft under firm pressure. No compact bone structure was used, because transplantation of such grafts frequently leads to sequestration.

Shortly after the transplantation, roentgenograms showed the formation of a dense area in the center of the cancellous bone graft which disappeared gradually. Apparently the periphery of the transplant remained viable and received adequate supply from the surrounding tissues. In a few instances, the center of the transplant had undergone necrosis but later became revascularized rapidly.

Nine patients with chronic osteomyelitis, ten patients with infected skull defects, and 20 patients with fractures of the lower jaw were treated with cancellous bone grafts. In 80 per cent of the patients, primary healing occurred uneventfully, whereas in 20 per cent, fistulas developed in the implant region.

Follow-up examinations were made at periods varying between six months and five years. When complete healing had occurred, the tomograms showed no difference between the grafted bone and the surrounding host bone.

The study is accompanied by 40 roentgenograms demonstrating the progression of healing.

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Changes in blood vessel patterns in bilateral cleft lip

Wayne B. Slaughter, James W. Henry and Jack C. Berger. *Plast. & Reconstr. Surg.* 26:160-179 Aug. 1960

The macroscopic and microscopic anatomy of the structures involved in bilateral cleft lip is described and illustrated, based on a study of four patients with clefts, five persons without clefts, serial microscopic sections from 20 infants with clefts, and postoperative observations on living human subjects after surgical correction of such defects.

The problem of surgically repairing a cleft lip based on the afore-mentioned observations seems to be threefold.

1. The undifferentiated or embryonal tissue along the cleft proper must be sacrificed to a depth sufficient to encounter normal muscle con-

taining normal vascular structures. Bringing normal muscle into direct approximation with normal muscle should yield a minimal amount of scar and should at the same time allow for a re-establishment of the orbicularis as a continuous muscle band. Nothing is done to alter the direction of muscle fibers that will have an adverse effect on function.

2. If extensive undermining, excision or incision (to form flaps) of the tissue bordering the cleft is carried out, the blood supply to the philtrum may well be compromised. In the instance of bilateral cleft, this can lead to temporary or even permanent changes in the soft tissues. It is logical to assume, therefore, that only one side of a bilateral cleft should be repaired at a time. This allows for a revascularization of the region in a manner compatible with accepted plastic surgical problems. The double cleft thereby is first converted into a single cleft.

3. The repair must be designed to achieve a satisfactory esthetic and functional result. The philtrum is the central portion of the lip and its lateral borders are gently curving lines which start at the medial borders of the floor of the nostrils and extend inferiorly to the region of the center of the lip at the mucocutaneous junction. This region is designated the labial tubercle. It has both anterior and posterior components. The labial tubercle represents the region of fusion of the philtrum with both maxillary segments. The surgical repair, therefore, is logically aimed at creating a curving border of the philtrum and bringing the three elements of the upper lip together at the labial tubercle.

On the medial or philtrum side of the cleft, the incision starts well within the nostril. It extends in a curving fashion to the lowermost point of the philtrum stopping just short of the mucocutaneous border. A similar incision is made on the lateral or maxillary side of the cleft. These incisions must be made perpendicular to the skin surface. A slight excess of vermilion is left on the lateral segment which is used to give normal fullness to this portion of the lip.

Stability of the repair is obtained by using figure-of-eight sutures of no. 0000 nylon that are placed in position starting on the mucous membrane surface and are made to include the full thickness of the muscle. The skin edges are approximated with a running subcuticular suture of no. 00000 nylon occasionally augmented with interrupted sutures of no. 000000 nylon. The floor of the nose and the vermilion surface are approximated with interrupted sutures of no. 0000 white silk.

No surgery of any kind is performed on the bony elements of the region. Undermining of the premaxillary segment is contraindicated.

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Perforation of the middle third of the face by a foreign body

Frank W. Stewart. *J.Oral Surg.,Anesth. & Hosp.D.Serv.* 18:512-513 Nov. 1960

A 47 year old man was admitted to the hospital two and a half hours after an automobile accident. A gearshift lever had passed completely through the middle third of the face. The lever had entered the left side of the face, passed through the maxillary sinus floor, the palate and the oral cavity and exited from the oral cavity through the right anterior tonsillar pillar. The tip of the lever had passed medial and posterior to the neck of the right condyloid process and exited under the ear between the neck of the condyloid process and the right mastoid process. The lever then had broken off and was still in place at the time of the patient's hospital admission. The patient was conscious and coherent.

He was taken to surgery and placed under general anesthesia. The knob on the gearshift lever was unscrewed and the lever was slowly withdrawn. All wounds were irrigated, debrided and closed, drains were placed; on the sixth postoperative day, the patient was discharged from the hospital afebrile and in good condition, but with a 50 per cent loss of function of the superior branches of the seventh cranial nerve on the right side. Ten days after discharge, the seventh nerve function had improved considerably and the right eye appeared normal. Three months after injury, there was almost 100 per cent return of seventh nerve function. Occlusion and mandibular function were excellent. The only permanent damage resulting from this injury was a loss of three maxillary teeth.

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Anesthesia and analgesia

Painless dental needles

Blanche Fearington. *Monde dent.* 11:15-20 Sept. 1960

Freedom from pain, crossinfection and allergic reaction during and after dental injections can be obtained by the use of sterile Monoject (400) disposable dental hypodermic needles.

The point of the commonly used dental needle remains sharp for the first injection only. Thereafter, an increase in pain occurs caused by the dulled point. Although the point can be resharpened after each injection, the time and expense involved in a repeated resharpening make the cost of such a needle much higher than that of a Monoject needle.

In 1940, a leading manufacturer of dental instruments claimed that his hypodermic dental needles could be used satisfactorily for 3,000 injections. Today, most dentists are concerned with the question whether a hypodermic needle should be used for one or five injections. Unquestionably, the discomfort of the patient increases after each use of a needle, and pain frequently becomes unbearable during the fourth or fifth injection.

The lancet point of the Monoject needle is so sharp that trauma damage to tissue is at the lowest level and healing at the highest.

The danger of crossinfection is always present when dental needles are used more than once. Pathogenic microorganisms can be destroyed by saturated steam in autoclaves, provided the needles are absolutely clean and their passages are not obstructed. Not all dental offices, however, are equipped with autoclaves, and there is no known way to dislodge microorganisms from the cannula lumen of the commonly used needles.

Pyrogens formed by microorganisms may cause a sudden rise in temperature when injected into tissue, as well as serious allergic reactions. Before the needles are reused, no thorough check can be made to determine whether pyrogens are present within the passage. The Monoject disposable dental hypodermic needles, however, are sterilized in ethylene oxide before packaging and are nonpyrogenic. Their tubing is made of stainless steel, the eyelet retainers are made of aluminum resistant to corrosion, and the other parts of chemically inert polyethylene. They also provide protection against breakage during injection.

The Monoject needle has been tested clinically and experimentally at the Massachusetts General Hospital, the Johns Hopkins Medical School and the Texas Medical Center as well as by many dental practitioners in Florida. All researchers found that these disposable dental needles have the following advantages: (1) absence of injection pain; (2) avoidance of crossinfection, and (3) absence of allergic reactions (especially to foreign proteins).

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Current concepts in therapy: Local anesthetics. I.

Leroy D. Vandam. *New England J.Med.* 263:748-750 Oct. 13, 1960

Few drugs are as frequently used as local anesthetics, and few have more predictable effects. Their wide usage stems from the apparent ease of administration, their therapeutic effect in relieving pain and their consequent ready acceptance by the patient. Yet it is probable that no other class of drugs is used so ineptly and results in so many immediate adverse reactions. Both the failures and complications are produced by a lack of understanding of a few simple pharmacologic facts and technical principles.

Local anesthetics are applied to the body surfaces and injected about nerves chiefly to prevent pain in surgical procedures. These drugs interfere with the initiation and transmission of the nerve impulse by mechanisms that have been explained on the basis of biochemical and physical changes. The local anesthetics prevent the depolarization of the nerve membrane that is necessary for the propagation of the impulse. This has been thought to be due to interference with the mutual exchange of sodium and potassium ions across

the membrane. As a consequence, a negative electric potential necessary for a propagated discharge does not develop. The ester structure of some of the local anesthetics also suggests that they may compete with acetylcholine, the substance thought to be the chemical mediator for nervous transmission. Only weak concentrations of an anesthetic need be employed to eliminate most of the painful types of impulses.

Cocaine was the first local anesthetic introduced to medicine. In 1884 Köller used it as a surface anesthetic in the eye. The high incidence of toxic reactions after injection of cocaine, the liability to addiction and difficulty in preparing sterile solutions early led to a search for a synthetic compound with fewer undesirable properties. Most of the local anesthetics subsequently synthetized have retained the ester structure of cocaine and the chemical suffix "caine" in their nomenclature.

Procaine was prepared by Einhorn in 1904. Procaine hydrochloride lacks surface anesthetic activity but probably is the most widely used local anesthetic today. For reasons of minimal systemic toxicity, lack of local irritation, ease of sterilization, reasonable duration of action and low cost, it is doubtful if procaine will be supplanted by any other drug.

Chloroprocaine, like procaine, is not topically active but is of greater potency and shorter in duration of action. Probably it is the safest local anesthetic from the standpoint of systemic toxicity.

Although piperocaine hydrochloride produces topical anesthesia and a longer duration of anesthesia, there is little to recommend it over procaine for ordinary purposes.

Hexylcaine hydrochloride possesses few unique properties to recommend its use over the drugs already mentioned.

The potency and duration of action of tetracaine hydrochloride are greater than those of any other anesthetic thus far mentioned, and the systemic toxicity is correspondingly greater.

Of the nonester compounds, dibucaine hydrochloride is an extremely potent anesthetic with high systemic toxic properties.

The major advantages of lidocaine hydrochloride are the rapid onset of anesthesia and freedom from local irritative effect. The potency and duration of action are moderately greater than those of procaine, and the topical activity seemingly not as effective as that of cocaine. Lidocaine lacks the vasoconstrictive property of cocaine and because of its nonester structure is detoxified in the circulating plasma slowly. Lidocaine is a suitable substitute for procaine and its derivatives when allergic reactions to the latter have been demonstrated.

Many of the antihistaminics provide topical anesthesia, a property that bears little relation to antihistaminic activity. These substances occasionally are used to effect anesthesia of the oral, urethral or rectal mucous membranes but are never injected about nerves because of the burning and irritation produced.

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Faulty anaesthetic apparatus

Philip Ayre. *Brit.M.J.* No. 5205:1084-1085 Oct. 8, 1960

Shortly after returning from a holiday, the author was asked to anesthetize a child in one of the local hospitals, for the extraction of some teeth. The apparatus in use in the dental clinic of this hospital is a reliable intermittent positive-pressure machine which has given excellent service during the past 11 years, and which was in normal working order on the last occasion it had been used. During the induction, the regulator was adjusted to give 10 per cent of oxygen; but, instead of this having the desired effect, an acute anoxic crisis occurred which nearly resulted in the death of the patient. More or less the same thing happened in the next patient. Suspecting a fault in the machine, the author carried out a rough test which showed that apparently no oxygen emerged from the machine until the regulator was turned to about 12 per cent as indicated on the dial.

Inquiry revealed that during the author's absence on holiday, the apparatus had been dismantled and serviced, not by the manufacturer's agents but by the service mechanic of another company. The apparatus was sent to the manufacturer's depot for examination and testing. In due course a report was received stating that "an excessive amount of grease had been placed upon the mixing key, thus obstructing the free flow of

oxygen through the oxygen port, causing the mixtures of nitrous oxide and oxygen to be extremely inaccurate."

The object in reporting this mishap is to draw attention to the unsatisfactory conditions under which routine servicing of anesthetic apparatus often is carried out. It is time that more stringent regulations were enforced by hospital authorities. Whenever possible, routine service and overhaul should be carried out only by the manufacturer or his agents, and a certificate issued stating that the apparatus is in proper working order within reasonable limits of accuracy—say, complete accuracy between 0 and 10 per cent of oxygen, and not more than 1 per cent error between 10 per cent and 20 per cent of oxygen. These rules also should be applied when new apparatus or pipelines are installed. At present, such contracts frequently are given to outside firms with little or no knowledge of anesthetic requirements.

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Preanesthetic medication

Philip D. Woodbridge. *J.A.M.A.* 174:437-438 Sept. 24, 1960

Satisfactory preanesthetic sedation from the almost routine use of promethazine with either scopolamine or atropine was reported by George Wallace (1960). He shares the belief that narcotics should not be used for preanesthetic medication except in the presence of the major indication for such agents—pain. Presumably, Wallace referred to pain existing prior to the surgical intervention. However, drugs should be used only for definite therapeutic purposes, and using a drug that is mainly a pain reliever should be avoided unless pain is present.

There are at least two other factors which should be taken into consideration before deciding to avoid the use of narcotics preoperatively: (1) practically every surgical intervention involves pain, and (2) generally narcotic agents produce not only desirable sedation but also drying of the mucous membranes as well as relief from pain.

Anesthesia, especially general anesthesia, has four main components: (1) sensory block (pain prevention); (2) motor block (producing relaxation); (3) mental block (inducing sedation or sleep), and (4) blocks of other reflexes and undesirable phenomena which involve mainly the respiratory, circulatory and gastrointestinal systems.

Few patients are so stoic that they do not need some mental block before or during an operation; therefore, promethazine (Phenergan), the sedative thiopental sodium (Pentothal Sodium), barbiturates, narcotics or an anesthetic (to be inhaled) should be used. Many undesirable phenomena can be prevented by administration of atropine or scopolamine and by other means which produce a sensory block. An adequate sensory block may be produced by general anesthetics, local anesthetics and, in varying degree, by narcotics.

Narcotics have several possible uses in surgical interventions because of their sensory blocking action. These agents can be used to dull the prick of the intravenous or local anesthetic injection needle. Narcotics also may counteract any deficiency of local anesthesia. Their preanesthetic use may prevent undesirable reflexes such as cardiac arrest often occurring in the "crash" technic of tracheal intubation. Neither barbiturates nor relaxants commonly used in this technic produce sensory block. Throughout the surgical intervention, narcotics may supplement the nonsensory blocking of barbiturates and the weak sensory blocking action of nitrous oxide when these agents are used as the main anesthetic drugs.

Preanesthetic medication should be planned with the entire clinical picture in mind: individual characteristics of the patient, requirements of the surgical intervention to be performed and kind of anesthesia to be used. Almost all surgical patients need pain relief and most of them need sedation, both of which can be obtained by preanesthetic use of narcotics. Therefore, narcotics should not be excluded arbitrarily as preanesthetic agents.

Instead of accepting Wallace's plan of using the same preanesthetic dosage "for practically all patients, regardless of age [except infants], preanesthetic condition, surgical risk and operative procedure," one would be wise to vary the doses of preanesthetic agents according to the apparent need of each patient.

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Prosthetic dentistry

Production of silver surfaces on dental casts

David C. Hoppenstand. *J.Pros.Den.* 10:733-736 July-Aug. 1960

The main advantages of a metal-coated die are its hardness and its marginal detail. A simple procedure and an inexpensive apparatus for making silver-plated dental casts from rubber base impressions are described. The parts are obtainable from any supplier of radio components. The basic features of the wiring circuit (illustration) were suggested by Bliss (1958). Cost of the apparatus is about $12.00. The apparatus is built into an aluminum chassis with plug-in leads for the anode and cathode connections. A plastic dish of the type used in domestic refrigerators contains the plating bath. The plastic cover of the dish is drilled to accommodate sockets, and alligator clamps are soldered in place on the underside of the cover to hold the anode metal and the object being plated.

The plating solution consists of 15 oz. silver cyanide dissolved in 1 qt. distilled water. The solution should stand 24 hours before use. The plating unit should be operated in a well-ventilated room.

The silver content of the solution is maintained by dissolution of the anode; therefore, the original volume of solution should not change except through evaporation of water, which can be compensated for by the addition of distilled water. Minor amounts of sludge accumulating on the bottom of the tank must be removed by filtering the solution through paper. The surface of the anode should be about twice that of the object being plated.

A fine silver powder is required, in addition to the piece of silver serving as the anode. The powder establishes an electrical conducting surface on the nonconducting impression material.

The impression is cleaned, rinsed with water and dried. A masking substance is applied to the surfaces of the tray or band that are not to be plated. A suitable masking material is the adhesive used to coat the plastic trays before making a rubber-base impression. Next, the fine silver powder is dusted into the impression. All surfaces to be plated must be covered completely.

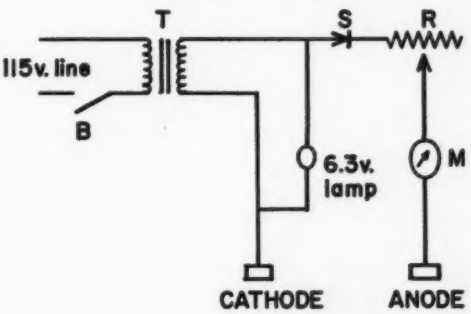
The impression is attached to the cathode. A length of 28 gauge copper wire is wrapped around the impression to produce good electrical contact with the silver powder. The fine wire is attached to a piece of stiff wire held in the alligator clamp. The impression is filled with solution from the tank by means of an eye dropper. If bubbles are present, the solution is removed from the impression and replaced.

The impression is placed in the solution and completely submerged. The concavities in the impression should face upward to prevent entrapment of air and to allow inspection during the plating process.

The plating unit is connected and the current adjusted by means of the potentiometer knob to 10 ma. for a band impression or 60 ma. for a tray impression.

The flash coating is deposited within 1 or 2 minutes. If the current is too strong the solution will bubble and the silver deposit will have a granular appearance. After one hour, the impression is removed from the tank and inspected. Surfaces that have not received the flash coating are

A wiring diagram for a simple plating apparatus. T = transformer, 6.3 v., 2 amp. S = rectifier, six-plate selenium. R = potentiometer, 100 ohm. M = milliammeter, 0 to 100 ma. B = switch, off-on, two-pole



apparent and should be redusted with silver powder after the impression has dried.

The impression is replaced in the solution and the current is raised to 50 ma. for each band impression or to 100 ma. for each tray impression. The plating should be continued overnight if a thick coating on the die is desired. If plated for 4 to 6 hours the impression will have a silver coating of about 0.004 inch. The silver coating does not alter the dimensions of the final cast.

Dowel pins are inserted in the usual manner, and the cast is poured in artificial stone. After the stone has set, the die is removed from the impression and sectioned.

The accuracy of casts coated with silver in this way is clinically acceptable under most circumstances. The hard silver surface has qualities superior to those of artificial stone.

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Technic for casting gold to gold and for repairing dentures

Jed Kovalski. *Rass.odontotec.* 7:43 Oct. 1960

Gold is cast to gold more frequently for repairing dentures than for soldering purposes. The casting technic may be used to add a clasp, bar or backing to the denture or to cast a gold coping.

When casting gold to gold—whether in construction or repair of a partial denture, bridge or coping—the fusion of the metals resembles soldering.

In soldering it is important to keep the parts to be joined clean and free of oxides to permit the solder to flow, thereby providing a strong fusion. The proper reducing flame of the blowtorch prevents the formation of oxides on the gold surfaces and enables the solder to flow freely. If oxide formation occurs, the solder cannot flow and alloy with the parent material.

When casting gold to gold in a coping embedded in an investment, the base metals in the gold coping have to be prevented from oxidizing. This can best be done by using an investment material that contains a deoxidizing agent (graphite or powdered copper), which will assure an easy alloying of the gold being cast with the coping surface.

Because a second casting will be made over the coping, it is important to construct the coping as thin as possible. This can be accomplished by using a flowing wax on the die, applied with a spatula, by dipping the die into molten wax or by adapting a thin sheet of wax (from 30 to 32 gauge) to the die.

A shoulder then is formed with wax (about 1 mm. thick) above the margins, except at the labial margins where the shoulder should be kept about 0.5 mm. above the margins.

The second casting then is cast to a wider surface than supplied by the comparatively thin gingival margins. The wax coping is sprued, invested and cast in the same manner as applied in casting a crown or an inlay. The cast coping, however, should be thinned a little with a mounted stone or bur, and the margins polished with sandpaper or rubber wheels.

The crown is waxed over the coping according to the desired form. The wax is carried slightly over the shoulder at all surfaces with the exception of the labial surface. A sprue is added to the distal and mesial area. Two sprues permit the gold to enter the mold cavity and to flow over the coping much faster than if only one sprue is used.

The crown and coping are invested, using an investment material containing a deoxidizing agent. The manufacturer's directions for the investment-water ratio should be followed.

When an inlay ring is used, the burnout time is 1 hour at 1,200°F. starting from a cold furnace, 1½ hours for a medium size ring, and 2 hours for a large ring. Temperatures above 1,200°F. will eliminate the deoxidizing agent in the investment and permit the coping to oxidize, thereby preventing the gold from flowing freely and alloying with the surface of the coping.

The gold to be cast over the coping should be heated an additional 100°F. to permit free flowing over the coping and to prevent it from premature cooling.

When soldering a bridge, the units are easily accessible and, therefore, can be heated easily and quickly. When gold is embedded in an investment, however, it must be heated an additional 100°F. before casting.

With a "Thermotrol" (J. F. Jelenko & Co.), casting gold to gold is no problem. Instead of

being cast at a temperature of 1,870°F., it is heated another 100°, and then cast at 1,970°F. The casting is removed from the investment immediately after cooling and, when it loses its red heat color, it is quenched in water.

Because a casting will expand after being exposed to heat, it is important to provide for this expansion, otherwise distortions will occur.

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Hypnosis in dentistry

R. H. Chase. *J.Michigan D.A.* 42:393, 396 Oct. 1960

This is a case report of an unusual application of hypnosis in dentistry. The hypnosis was carried out not by the dentist but by a physician trained in the field.

A complete upper denture was indicated for a 32 year old dental patient. He had five remaining upper teeth, all in poor condition. Several years earlier, when impressions for study models were attempted, the patient exhibited such a vigorous gag reflex that neither an upper nor a lower alginate impression could be taken. He was admonished at that time to do what he could to preserve his remaining teeth, for it appeared he would never be a denture wearer.

Later, another attempt was made to take a snap impression; lidocaine was used and an ethyl aminobenzoate spray was applied. This attempt also was in vain. It was then suggested that hypnosis might be tried. A local physician, who had used hypnosis in his medical practice, was consulted; he suggested that treatment be instituted immediately.

The patient proved cooperative. He had three sessions with the physician and was a model hypnotic subject. At each session he was put in a light to medium trance and given the posthypnotic suggestion that not only would he be able to tolerate the impression taking, but that he would be able to wear the denture without gagging.

After the third session, the physician advised the dentist that the patient was ready for dental treatment. The physician accompanied the patient to the office and put him in a light trance before the impression taking, repeating the posthypnotic suggestions.

Preparation and alginate impressions were started. About midway through the taking of the lower impression, gagging started and the tray had to be removed before the material had set. A teaspoonful of lidocaine hydrochloride 2 per cent in a viscous sodium carboxymethylcellulose base was given, and after a five minute pause, impressions were started again. This time, upper and lower alginate impressions were taken without difficulty. At subsequent sittings vertical dimensions and centric relations were obtained, and within two weeks an immediate upper denture was inserted with no difficulty.

The patient has worn the dentures for five months, has no trouble, and is perfectly adjusted to dentures.

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Proper prospective

Editorial. *J.Alabama D.A.* 44:4:18-19 Oct. 1960

On November 5, 1959, the Commissioner of Revenue for the State of Alabama made an administrative ruling which required dental patients to pay a state sales tax on dental prosthetic appliances. The Alabama Dental Association, through appellees, filed for an injunction to prevent the Commissioner from collecting this tax. A temporary injunction was issued, which later became permanent when the Circuit Court of Montgomery entered its final decree. Judge Walter B. Jones stated in the court's final decree:

"Dentists are not traders in commodities engaged in a merchandising business. A dentist is a practitioner of one of the true 'learned professions,' like unto a physician or surgeon. Dentistry is one of the healing arts, a department of medicine; and dentists, like physicians, perform the very highest type of skilled professional services for their patients. Dentists are men of profession, who by virtue of their talents and aptitudes, and long years of study, and formal education, qualify themselves to serve mankind and to alleviate human suffering. When a dentist furnishes a prosthesis to his patient, this is an inseparable and indivisible part and parcel of the professional service of dentistry, which concerns itself with diagnosis, treatment, restoration, and prevention.

A dentist does not, under the common understanding of things, or under the terms of the Sales Tax Act, make a sale to his patient. His relationship to his patient is not that of merchant and 'customer' but that of doctor and patient; a close relationship requiring the skill and expertness that come with a concentrated background of education, training, and qualification. A patient goes to a dentist seeking treatment and professional care and attention, and that is what he gets, and the amount paid the dentist by the patient is the dentist's fee for professional services.

"The fashioning and furnishing of dentures, crowns, inlays, bridges, and similar medical prosthetic devices, by a dentist, incidental to his professional care and treatment of his patient, is not a retail sale of tangible personal property taxable under the Alabama Sales Tax Act. Skilled professional service is that which is required of the dentist, furnished by him to the patient, charged for by the dentist, and paid for by the patient."

The Revenue Commission has appealed this decree to the State Supreme Court and oral argument has been requested by both sides.

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Alterations in tissues underlying complete dentures

H. van Thiel. *Internat.D.J.* 10:518-525 Dec. 1960

The changes which occur in parts of the mouth underlying complete dentures can best be determined after the dentures have been worn for some time. Alterations in the tissues and shape of parts of the mouth underlying the dentures are of three kinds:

1. If the artificial teeth have been suitably set up and the dentures well made, the basic structure of the jaw does not undergo any change, even after 40 years. The size of the contact surfaces, the position relation of the edentulous jaws to each other, and the correct setting up of the artificial teeth, all make for a harmonious relation. On the other hand, if the relations are nonharmonious, the supporting tissues undergo a change in form by an unfavorable load on the supporting surfaces. These nonharmonious relations necessitate setting the artificial teeth outside the definite support. With continued use of the dentures, movements are developed by the correlation of muscular activity which have an exaggerated squeezing and shifting effect on the soft tissues of the residual ridges, causing inflammation with thickening of the mucous membranes and resorption of the bone.

2. The irritation due to a foreign body as caused by dentures always elicits typical reactions of the tissues of the residual ridges. Typical epithelial changes are thickening and keratinization. Connective tissue reactions are of an inflammatory, edematous and fibrous nature. The oral glands undergo congestion and atrophy. All residual ridges underlying complete dentures undergo some of these changes. Resorption and occasionally limited apposition of bone also may occur.

3. Stomatopathic disorders caused by dentures possess a distinctive character and are linked with systemic conditions. Such disorders appear as large areas of inflammation in the soft tissues, or as small solitary spots on the mucosa, outside the area covered by the dentures. Severe subjective disorders, such as smarting and secretory changes of the oral glands, may occur. Such reactions under the dentures may be exaggerated by diseases of the blood, metabolism and digestion, and by infectious diseases or therapeutic damage (as from penicillin), hormonal conditions, pregnancy and the climacteric.

Two case histories illustrate some of the tissue changes discussed.

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Therapeutics

Aphthous stomatitis

J. G. Rosenbaum. *J.A.M.A.* 174:1360 Nov. 5, 1960

Several years ago the author discovered how he might avoid or precipitate in himself an attack of aphthous stomatitis. Certain foods always will produce an aphthous ulcer in the author's mouth between 48 and 72 hours after ingestion. These foods include chocolate, potato chips and salted nuts. By avoiding such foods, the author remains free of ulcers which formerly were troublesome as often as weekly.

Ingestion of foods that have been fried in deep fat, when cooled and packaged, may contain stearates which undergo changes while they remain on store shelves and age. This appears to be true of bags of salted nuts, potato chips and other products which may not be consumed for weeks after packaging.

Chocolate is an offender because the cocoa butter content of chocolate is a compound containing stearates. Chocolate, too, is a food which may remain on the shelf for long periods. All foods which contain stale stearates are classed as offenders as regards aphthous stomatitis.

The late Frank Regan's treatment for aphthous stomatitis was as follows: The ulcer is wiped dry. The field is protected against saliva for the minute or two that treatment is administered. The distal half-inch of an applicator that has been whittled to about a half its original diameter, is moistened in fuming nitric acid, and then the center of the ulcer is touched with the applicator. The pain is not intense; the center of the ulcer will discolor as it undergoes desiccation. Contact for 30 seconds is sufficient to complete the cautery. The area then is sponged or rinsed to remove any excess acid. The acute pain of the ulcer disappears by the time the treatment is completed, and there no longer is any awareness of the presence of the ulcer.

Comment by Seymour J. White: If, as suspected, aphthous stomatitis is viral in origin, it would be difficult to explain the effect of diet on the eruption. In some persons it is known that certain foods will trigger the disease. The theory of stale stearates requires confirmation; ingestion of the suspected food while fresh would be the first step in such investigation. If the aphthae fail to appear, then, obviously, staling could be a factor.

The described treatment with nitric acid may be effective in some patients. Caustic applications for aphthous stomatitis always have been listed as appropriate therapy, and include such remedies as 10 per cent silver nitrate, powdered alum, and chromic acid.

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Comparative clinical effectiveness and toxicity of vancomycin, ristocetin and kanamycin

Burton A. Waisbren, Leonard Kleinerman, Joseph Skemp and Glenn Bratcher. *A.M.A.Arch.Int.Med.* 106:179-193 Aug. 1960

Patients with severe staphylococcal infections that have not responded to the usual antimicrobial therapy are frequently seen in medical and dental practice. Data regarding the relative efficacy and toxicity of ristocetin, vancomycin hydrochloride and kanamycin sulfate may help practitioners to make a decision about further antibiotic therapy for those patients.

It was possible to alternate the use of these three antibiotics in a group of seriously ill patients because the drugs were discovered within such a short time and none of them could be established as "the antibiotic of choice" in severe staphylococcic infections.

In this study, each of the three antibiotics acted as a control for the others, thereby circumventing the necessity of extrapolating opinions regarding their effectiveness in severe infections from the actual experience with milder infections.

Ristocetin was discovered in 1956 by Grundy and co-workers at the Abbott Laboratories in Chicago. All clinically isolated staphylococci apparently are sensitive to its action. The drug is ad-

ministered by the intravenous route. Best results are obtained if 1 Gm. ristocetin, dissolved in 150 ml. of 5 per cent dextrose and water, is given by rapid intravenous injection.

Vancomycin was discovered in 1956 by McCormick and co-workers at the Lilly Laboratories in Indianapolis. All clinically isolated staphylococci are sensitive to its action, and the drug has been used in a wide variety of staphylococcal infections with excellent results. Vancomycin is administered intravenously in daily dosages of 2 Gm. dissolved in from 500 to 1,500 ml. of 5 per cent dextrose and water.

Kanamycin was discovered by Umezawa and co-workers (1957) in Japan, and is commercially developed by the Bristol Laboratories in Syracuse, N. Y. All clinically isolated staphylococci are sensitive to its action. Data regarding its clinical effectiveness were presented at a symposium of the New York Academy of Medicine in September 1958.

All three drugs were alternatively administered to 131 patients with severe staphylococcic infections (some of dental origin). The groups of patients were found to be comparable (the mean age of 51 patients treated with ristocetin was 50 years, that of 54 patients treated with vancomycin was 54 years, and that of 54 patients treated with kanamycin was 54 years). There were nine Negroes in the kanamycin group, three in the vancomycin group and seven in the ristocetin group. There were a few more men than women treated with each antibiotic.

The relative clinical effectiveness and toxicity of the three drugs were determined. Each antibiotic was effective in slightly over one third of patients. None of the antibiotics showed clinical superiority over the others.

Significant ototoxicity and nephrotoxicity were found with all three drugs. In addition, ristocetin caused a comparatively high incidence of skin reactions and produced depression of the granulocytic series of white blood cells in some patients.

The results of the study, presented in 18 tables, indicated that ristocetin, kanamycin and vancomycin are effective antistaphylococcal agents of an approximately comparable activity. The three antibiotics exhibited a toxicity greater than that found in tetracyclines, penicillins, chloramphenicol and erythromycin. Therefore, ristocetin, vancomycin and kanamycin should be used only in patients who have not or are not likely to respond to safer antibiotics, or in patients whose condition justifies the risk of serious toxic reactions.

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Treatment of shock with sympathicomimetic drugs: use of metaraminol and comparison with other vasopressor agents

Lewis C. Mills, Ignatios J. Voudoukis, John H. Moyer and Charles Heider.
A.M.A.Arch.Int.Med. 106:816-823 Dec. 1960

Although several vasopressor agents are available for the treatment of shock, many of these drugs are characterized by one or more undesirable properties. During the last years, most of these agents have been used in patients with shock from various causes at the Hahnemann Medical College and Hospital in Philadelphia, Pa.

These observations indicated that metaraminol was an effective drug in the treatment of shock, and that side effects were infrequent. Therefore, additional laboratory studies were performed with a group of 67 patients with shock resulting from various causes.

The effects of the following drugs were studied: mephentermine (Wyamine), metaraminol (Aramine), phenylephrine (Neo-Synephrine), levarterenol (Levophed, norepinephrine), methoxamine (Vasoxyl), and epinephrine. Epinephrine was included only for comparative purposes because its use in the clinical treatment of patients with hypotensive shock is contraindicated.

In the treatment of shock it is usually desirable to raise the blood pressure to normal levels as soon as possible, because vital organs and tissues may suffer irreparable damage as a result of low blood pressure. All the drugs included in the investigation are commercially available for this purpose. At first glance it might seem, because all of these drugs are sympathomimetic amines and are able to raise the blood pressure, that they could be used interchangeably at the medical or dental office. However, the results obtained in this investigation indicate that the effects of these

drugs on the blood flow to a given tissue are not quantitatively similar.

Mephentermine and metaraminol increased the blood flow in patients with experimentally produced shock. The other sympathomimetic drugs, especially methoxamine, did not. Metaraminol is a potent, effective agent in the treatment of shock. Its relative lack of vasoconstriction (in comparison to levarterenol and methoxamine) is particularly desirable in shock conditions occurring at the dental or medical office. Although mephentermine and phenylephrine also demonstrated desirable properties in this regard, they are not sufficiently potent to treat any but the milder degrees of shock. Almost 100 per cent of the patients with shock showed an initially satisfactory response to metaraminol; this drug should be used first because of its minimal side effects and other desirable properties, especially the better control of the patient during and after its administration.

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Treatment of trigeminal neuralgia with cobra venom

E. Y. Williams. *J.Nat.M.A.* 52:327-328 Sept. 1960

To provide the patient with trigeminal neuralgia some measure of relief short of an operation, alcohol injections at the angle of the jaw usually are carried out. Research has been conducted to find some preparation and method that would be simpler but equally as effective as the alcohol injection. Inasmuch as procaine hydrochloride can produce adequate local anesthesia in any area of the skin, an attempt was made to find some preparation that would affect the peripheral nerves, and either potentiate the action of procaine or act synergistically. An experiment was carried out with cobra venom solution.

The subjects consisted of seven patients with trigeminal neuralgia. Five had received alcohol injections previously, the longest remission being 13 months and the shortest, 5 months.

All seven patients were treated with 0.25 cc. procaine hydrochloride and from 0.25 to 2 cc. of cobra venom. All patients have been followed for one year, and none has yet reported a return of symptoms. One patient was seen four years after the injection and reported no return of symptoms. Three case reports illustrate the treatment.

No untoward effects or sequelae were observed from the use of cobra venom. In instances of persistent pain, cobra venom has advantages over morphine and its derivatives in that it does not produce addiction or withdrawal symptoms.

The number of cases reported is inadequate as a basis for definite conclusions, but cobra venom does appear to have substantial clinical value and advantages.

Howard University, Washington, D.C.

Treatment of Quincke's edema

D. G. R. Findeisen. *Med.Klin.* 51:2306 Dec. 16, 1960

Angioneurotic edema or Quincke's disease (Quincke described the disease in 1882) is characterized by the sudden appearance of edematous swellings on the lips, cheeks, tongue, soft palate and uvula. The lesions may affect the pharynx and produce difficulty in breathing and masticating.

Many etiologic factors have been suggested, such as allergy (urticaria, migraine, hay fever, bronchial asthma and other allergic reactions), neurosis or heredity.

Among the specific allergens to be avoided are the following: (1) drugs (salicylates, barbiturates, antibiotics, sulfonamides and anesthetics); (2) certain foodstuffs (milk, white of egg, fish, nuts, acid-containing fruits, vegetables and other protein substances); (3) pollen antigens; (4) tobacco; (5) contact antigens (lipsticks, soaps, cosmetic creams and powders, and tooth pastes), and (6) auto-antibodies (produced in the organism by bacteria, spirilla, rickettsia, viruses, molds and yeasts).

Treatment is based on finding and eliminating the causative factor (or factors). Staining the affected oral regions with a 4 per cent aqueous solution of methylene blue disinfects and coats the surfaces of the ulcerations and simultaneously relieves the pain. Epinephrine, from 0.5 to 1.0 ml. of a 1:1,000 solution injected intramuscularly, ephedrine or amphetamine sulfate should be ad-

ministered in instances of acute attacks. Tracheotomy is indicated if the pharynx becomes involved. In isolated instances, antihistamine preparations have obtained favorable results.

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Pharmacological principles

A. Bucher. *Schweiz.Mschr.Zahnhk.* 70:948-949 Nov. 1960

The conditions under which a dentist may consider the use of an ataractic drug for premedication show two definite characteristics: (1) a comparatively mild emotional disturbance not associated with a serious disease, and (2) an indication that the effects of a single dose, or the administration (orally or intravenously) of two or three doses (1 Gm. each), given only within the first 24 hours will obtain the desired relaxing effect.

Highly effective tranquilizing agents such as reserpine or chlorpromazine should not be used in dental practice.

Single doses of meprobamate, promethazine, hydroxyzine or methylpentynol may be used for dental premedication, but will have only temporary effects in highly apprehensive patients. These ataraxics (especially meprobamate and promethazine) show a low toxicity and—if given in small amounts—hardly any untoward reactions.

In most countries, federal laws prohibit dispensing these drugs without prescription.

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Experience with methaminodiazepoxide

S. Wyss and C. Maier. *Schweiz.med.Wschr.* 90:1293-1296 Nov. 5, 1960

Methaminodiazepoxide (Librium) is a new drug with a comparatively broad range of pharmacologic activity.

The drug (7-chloro-2-methylamino-5-phenyl-3H-1,4-benzodiazepine-4-oxide hydrochloride) was administered in clinical testing to 50 patients at the District Hospital in Männedorf, Switzerland. The conditions treated were emotional and motor unrest combined with anxiety, tension and depression of predominantly psychosomatic origin.

The most prominent effect of the preparation was sedation depending on the dosage and ranging from a mild calming action to prolonged, drowsy sleep.

Frequently, the sedation was accompanied by relaxation which was deemed pleasant by all 50 patients. Because the drug was well-tolerated generally and exerted no influence on the mechanisms of autonomic control (pulse and blood pressure), it could be administered without hesitation in comparatively high doses even to patients with a history of circulatory disorders. Side effects such as dryness of the mouth, which frequently necessitate reduction of otherwise effective doses of other sedatives such as ataractic drugs, were not encountered with methaminodiazepoxide.

Initial doses from 100 to 150 mg. of the drug, administered orally and followed by rapid reduction in dosage to 25 to 50 mg., reduced anxiety and agitation but did not cloud consciousness or impair intellectual function. However, caution is required in the treatment of geriatric patients who sometimes exhibit paradoxical and dissociated reactions. In these instances a low initial dose (from 25 to 50 mg.) and maintenance doses (from 10 to 25 mg.) are advisable.

For the dentist, methaminodiazepoxide has the special advantage of prompt onset of action. Evidence of habituation or postmedication depression has not been observed.

Kreiskrankenhaus Männedorf, Switzerland

Androgen-estrogen therapy in osteoporosis of the jaws

H. J. Weber. *München.med.Wschr.* 102:1989-1991 Oct. 7, 1960

Forty-one patients (28 women and 13 men) with osteoporosis of the jaws were treated with an androgen-estrogen compound at the Orthopedic Clinic in Herborn-Dillkreis, Germany.

The drug (Femovirin-Hoechst) contains 3.5 mg. 17-estradiol cyclopentylpropionate and 62.9 mg. testosterone propionate.

The average age of the women was 52 years, and of the men, 47 years.

From 6 to 12 injections were given buccally or lingually. The treatment was carried out on an ambulatory basis without any other medicomechanical procedure.

The treatment results were as follows: excellent response in 3 women and 5 men; good response in 18 women and 5 men; moderate response in 4 women and 1 man, and no response in 3 women and 2 men. Permanent success, however, could be observed only in the men.

In six women, the symptoms of osteoporosis of the jaws recurred from three to four months after the last injection. Based on these clinical observations, an interval of three weeks between injections is suggested to obtain the maximum effect of androgen-estrogen therapy.

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Treatment of dry mouth

Peter Dykes, Peter Harris and Arthur Marston. *Lancet* No. 7164:1353 Dec. 17, 1960

Chief discomforts of a patient with scleroderma were perpetual dryness of the mouth and great difficulty in masticating food. These discomforts were the result of atrophy of the mucus-secreting cells of the oral mucosa and probably also of the salivary glands.

Treatment with pilocarpine was ineffective. The continuous sucking of sweets left only a nauseous stickiness which was even more unpleasant than the original complaint. It seemed logical to give something with little taste, a demulcent which would leave a thin film of mucus-like material in the mouth for a number of hours and which might stimulate any remaining active secreting cells.

Pastilles were prepared to the following formula: gelatine, 20 per cent; glycerine, 40 per cent; sucrose, 5 per cent; lemon essence, 0.6 per cent; sodium benzoate, 0.2 per cent; citric acid, 2 per cent; amaranth solution, 1 per cent, with water to 100 per cent.

Treatment with these pastilles was successful. The patient had to suck only one every four hours to ensure a reasonably comfortable mouth and greatly increased enjoyment of food. The pastilles are a soothing rather than a curative treatment.

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Allergic reactions to antibiotics

R. Schuppli. *Schweiz.Mschr.Zahnhk.* 70:939-943 Nov. 1960

In dental practice, knowledge of the possible allergic reactions to antibiotics is important because several manifestations may occur which often are difficult to differentiate, at least as to their causative factor.

Eczema is an acute or chronic, itching, inflammatory reaction of the epidermis, characterized by irregular and varying combinations of edematous, vesicular, papular, pustular, scaling, thickened or exudative lesions. It is usually caused by contact between an antibiotic (penicillin) and the epithelial layer of the skin.

Urticaria is a skin reaction characterized by the appearance of intensely itching wheals with elevated, usually white, centers and a surrounding erythematous area. Urticaria is the main symptom of penicillin allergy. The lesions occur either on the injection (contact) site or widely distributed over the body surface.

Serum sickness is a syndrome of allergic or anaphylactic reactions occurring after the injection of a foreign serum and characterized by urticaria, edema, adenitis, pain in the joints, extremely elevated body temperature and an abnormal fatigue. This syndrome was first observed after injections of diphtheria and tetanus serums but it occurs frequently ten days after a penicillin injection.

Anaphylaxis is the most severe form of an antigen-antibody reaction. From 10 to 12 days after the reintroduction of an antigen (all antibiotics can be considered as possible antigens), anaphylaxis may occur, manifested by a series of characteristic symptoms such as spasms of the smooth muscles, dilatation of the capillaries, extreme secretion of the glands, changed permeability of the vessels, and varying degrees of anaphylactic shock. Investigations of the antigen property of penicillin have revealed that this antibiotic contains a group of different fungi and

each species may act as an allergen toward the others. The close relation between fungus infection and penicillin allergy has been established in patients with any type of mycosis.

In dental practice, the use of penicillin should be avoided in patients with mycosis, asthma and eczema.

Because no certain test is known to determine the presence of a hypersensitivity to antibiotics or to a specific antibiotic (penicillin), the patient's history may provide a clue. If the dentist suspects hypersensitivity to an antibiotic in a patient but has no definite evidence, he should inject only a small amount (about 10,000 units) and wait for from two to three hours. If during this period, no allergic reaction occurs, the patient probably will tolerate a larger dose (from 100,000 to 300,000 units) without untoward effects. Sometimes, however, serum sickness appears ten days after injection. Immediate allergic reactions can be prevented by using an antihistamine-antibiotic combination.

The treatment of patients who go into severe anaphylactic shock at the dental office should consist of the following procedures:

1. Immediate support of the circulatory system by injection (intravenous or subcutaneous) of from 0.25 to 1 mg. of epinephrine. Adequate oxygen supply should be provided simultaneously.
2. After from 10 to 15 minutes, antihistamines may be given by injection.

Prednisolone administered in not too high a concentration (25 mg. per ml.) prevents delayed antibiotic reactions, including asthma and anaphylactoid shock.

The use of penicillinase in patients with anaphylactic reactions to penicillin produces effects too slow for an emergency measure.

Although allergic reactions to antibiotics (especially penicillin) may follow administration via any route, the oral route is least likely to produce acute anaphylaxis.

Unquestionably, a steadily increasing number of patients are penicillin-sensitive, therefore, other antibiotics should be administered at the dental office, and the use of penicillin injections be limited to hospitalized patients.

Dermatological Clinic, Bürgerspital, Basel, Switzerland

Experimental and clinical experiences with demethylchlortetracycline

Johann Meyer-Rohn. *Arzneimitt.Forsch.* 10:802-804 Oct. 1960

Demethylchlortetracycline ("Declomycin" in the United States and Canada, and "Ledermycin" in Europe) is a newly developed, easily tolerated antibiotic agent of the tetracycline group. The drug was isolated from a specific mutation of *Streptomyces aureofaciens.*

Compared with the previously developed three members of the tetracycline group, chlortetracycline, oxytetracycline and tetracycline, demethylchlortetracycline shows a significantly higher degree of stability (especially in resistance to the effects of acids and alkalis), a higher blood and tissue level and a more retarded excretion.

The antibacterial range of action of the new antibiotic appears to be similar to that of the other tetracyclines. However, its effects on *Staphylococcus pyogenes* var. *albus, Staph. pyogenes* var. *aureus, Streptococcus hemolyticus, Str. faecalis, Bacillus anthracis, B. subtilis, Corynebacterium pseudodiphtheriticum, Neisseria gonorrhoeae, Escherichia coli, Proteus vulgaris, Pseudomonas aeruginosa* and *Klebsiella pneumoniae,* tested in albino mice and in 51 patients with bacterial infections, appeared to be superior to those of the other tetracyclines. This was demonstrated in an investigation carried out at the Dermatologic Clinic of the University of Hamburg, Germany.

The clinical results with the new antibiotic, especially in treatment of bacterial infections of the oral cavity and the facial skin, were excellent. The drug's tolerability after administration of 600 mg. demethylchlortetracycline was satisfactory. The use of this drug is accompanied by a significantly lower incidence of side effects than the use of the other tetracyclines even after higher doses.

Demethylchlortetracycline can be recommended for the treatment of herpetic stomatitis, cellulitis, erythema multiforme and as a preventive agent against transient bacteremia associated with tooth extractions.

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Pathology

Development of the dentition in children with adenoidism

P. Adler and I. Jakabfi. *Deut.Stomat.* 10:592-595 Aug. 1960

Waldeyer's tonsillar ring, the lymphatic area formed by the two faucial tonsils, the pharyngeal tonsil and the small groups of lymphatic follicles at the base of the tongue and behind the posterior pillars of the fauces, is of great interest not only for pediatricians and otorhinolaryngologists but also for dentists. The symptom complex resulting from the presence of hypertrophied adenoids in children prevents normal nose breathing, and those children usually exhibit a habitually open mouth. This condition, in turn, affects the development of the jaws and the teeth.

Because the development of the dentition is extended over a long period, any investigation of the influence of adenoidism on tooth development must consider the biologic age rather than the chronologic age of the children. Such an investigation was carried out at the Otorhinolaryngologic Clinic of the University of Debrecen, Hungary. The study material consisted of 95 children (47 boys and 48 girls) between 4 and 14 years old. The number of erupted deciduous and permanent teeth was recorded. There were no sex-linked differences in premature or delayed tooth eruption.

Premature and delayed tooth eruption as well as defects in tooth development associated with the presence of adenoidism occurred mainly in children eight and nine years old. In the 95 children, 77 per cent had a normal tooth eruption and development; 13 per cent, a premature tooth eruption and some developmental tooth defects, and 10 per cent a retarded tooth eruption and some developmental tooth defects.

These findings, however, cannot determine conclusively a relation between adenoidism and tooth eruption or development, because in such a small group the findings may be more or less accidental; also, 25 per cent of the children were at an age in which retardation in tooth development and eruption cannot be established. The investigation will be repeated with a far larger group of children to determine whether the deviation from normal such as found in the present study can be determined by comparison of children with adenoidism (or adenoiditis) and those free from pathologic involvement of Waldeyer's tonsillar ring.

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Roentgenographic features of a new congenital dysplasia

Enrique Schwarz and Albert Fish. *Am.J.Roentg.* 84:511-517 Sept. 1960

The dominant feature of a rare syndrome described by Papillon-Leage and Psaume (1954) is the presence of multiple congenital anomalies of the oral cavity at the sites of embryonal unions. This congenital dysplasia occurs only in females.

The salient features of the syndrome are lobulation of the tongue and the presence of thick, paramedial vestibular bands extending across the alveolar ridges, and a tongue bound down to the floor of the mouth by a short, thick frenulum. The tongue may show small, nodular, pedunculated tumors.

An incomplete medial cleft of the hard palate associated with a partial upper medial cleft lip complicate the picture. These anomalies are readily discerned in the immediate postnatal period.

In the extremities, the presence of supernumerary digits may be noticed, as well as clinodactyly, syndactyly or a trident type of hand. Other anomalies which occur less frequently are aplasia of the wing of the nose, minimal hypertelorism and shortening of the upper lip. Alopecia, dryness of the skin, coarse hair, mental retardation and a familial type of tremor may be present.

Roentgenographic examination shortly after birth of the extremities in a typical case reveals definite abnormalities in the architecture of the short tubular bones of hands and feet which ap-

pear irregular, short and thick. As the child grows, there may be other anomalies, including uneven growth of some tubular bones of the hands or feet.

The skull exhibits distinct features consisting of a steep anterior fossa due to the elevation of the cribriform plate and lesser sphenoid wings. The floor of the posterior fossa moves downward and forward. There is an increase in the lower face height and the facial profile is retrognathic because of the presence of a hypoplastic mandible. The jaw appears small with shortening of its rami and sometimes with asymmetry of its body. Dental malplacements are seen in all instances and are more predominant in the incisors and cuspids. Supernumerary and carious teeth frequently are observed.

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What is systemic lupus?

William Damashek. *A.M.A.Arch.Int.Med.* 106:162-167 Aug. 1960

Systemic lupus erythematosus has been a mysterious disease since it was first recognized as an entity by Kaposi in 1872. At first thought to be a "toxic disturbance," later an infection closely related to tuberculosis, it was eventually classified as belonging in the category of "collagen disease." This is a disease group characterized by a lack of known etiologic factors, a diversity of clinical manifestations and histologically by a presumed generalized disturbance of collagen. Lesions on the lips, tongue, cheeks and hard palate occur which show an irregular outline and raised, grayish white nodules tending to ulcerate.

There exists sufficient evidence to call systemic lupus erythematosus a complex auto-immune disease with an irregular involvement of various components of the blood vessels, resulting in a highly protean disorder. Involvement in the beginning may be limited to a specific tissue, one organ or one blood cell constituent, with a progressively greater involvement as time goes on. Finally, systemic lupus erythematosus develops to a widespread generalized disease.

This syndrome occurs mainly in easily sensitized persons in whom, for reasons at present obscure, groups of abnormal antibody-producing cells have developed and are producing abnormal antibodies continuously. As in a "graft-versus-host" reaction, the antibodies may attack the patient either at once (fulminating course) or in an episodic but gradually intensifying fashion (progressive course).

Whether systemic lupus erythematosus may be said to be present at the appearance of initial clinical symptoms or whether the diagnosis can be made only in retrospect (after the development of a number of symptoms) should become clear with future studies.

At any rate, systemic lupus erythematosus has come a rather long way from the first concept as a "toxic disturbance" to its present status as a complex auto-immune disease, perhaps analogous to the experimentally produced "runt disease," thereby linked to the graft-versus-host reaction.

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Oral manifestations of pemphigus vulgaris

Taisa Merdi. *Czas.stomat.* 13:601-609 Sept. 1960

The diagnosis of the different types of pemphigus, especially that of pemphigus vulgaris, often is based on the early recognition of bullous lesions appearing on the surfaces of the oral mucosa as the initial symptom of the disease.

These successive crops of bullae, accompanied by a characteristic burning or itching sensation, after rupturing the mucous membrane, leave irregular pigmented spots. Unerupted bullae of pemphigus vulgaris are seldom seen on the oral mucosa, because its thin walls are immediately ruptured by mastication and deglutition.

Persistent, eroded and pigmented patches of the oral mucous membranes, especially if appearing in adult patients, should prompt an immediate referral by the dentist to a dermatologist for a thorough examination of the skin.

Vincent's infection of the oral cavity, desquamative gingivitis, gangrenous stomatitis, syphilis, vitamin deficiency and allergic reactions should be considered in the differential diagnosis. The appearance of recurring bullous lesions in and about the mouth in middle-aged and aged patients always should arouse the dentist's suspicion

regarding the possibility of pemphigus. After the exclusion of the differential diagnostic possibilities, such patients should be considered as having been affected by pemphigus vulgaris until proved otherwise. The dentist's early suspicion or diagnosis is important, because an early recognition of the condition leading to an immediate corticosteroid treatment not only may save the life of the patients but also may prevent the distressing physiologic and toxic side effects of a prolonged treatment of this type. Dentists, therefore, should be constantly on the alert in regard to the appearance of bullous lesions on the mucous membranes of the oral cavity or the upper respiratory tract.

Since the introduction of the corticosteroid therapy, the formerly high mortality rate of pemphigus vulgaris (more than 90 per cent) has been reduced to about 33 per cent. The mortality rate probably will be reduced further by early diagnosis and prompt therapy.

The cause of pemphigus is unknown, as is the reason for its extremely high incidence among adult Jews.

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Excessive stimulation of salivary gland growth by isoproterenol

Hans Selye, Rene Veilleux and Marc Cantin. *Science* 133:44-45 Jan. 6, 1961

In a recent experiment in which 30 rats were treated twice daily with 50 mg. of isoproterenol hydrochloride in 0.2 ml. of water, administered intraperitoneally, it was incidentally noted that after 17 days of treatment the salivary glands were enlarged to about five times their normal size. The weight range of the salivary glands in the experimental rats was 2,531 to 2,574 mg. after 17 days of treatment; the weight range of the salivary glands in control rats was 333 to 516 mg.

Histologic study revealed that the enlargement of the salivary glands is due almost entirely to intense mitotic proliferation of the serous, mucous and duct cells. It is accompanied by microscopic evidence of increased secretory activity.

The parotid, submaxillary and sublingual glands were enlarged to approximately the same degree. The induced parenchymatous growth of salivary gland tissue bears little resemblance to the various types of clinical sialadenitis. However, the changes produced by isoproterenol hydrochloride are structurally similar to the hypertrophies and hyperplasias of the human salivary glands in patients suffering from various endocrine and nervous diseases, or in patients suffering from malnutrition and psychic stress.

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Hemophilia B (Christmas disease): report of case

G. Crolle and T. Poletti. *Panminerva med.* 2:536-538 Nov. 1960

Since the discovery of the classic form of hemophilia by John C. Otto, an American physician, in 1803 several varieties of the disease have been reported in the literature.

Hemophilia A, a hereditary hypoprothrombinemia, is a sex-linked disease occurring only in the male members of an affected family but is transmitted by the female members. It is characterized by an impaired blood coagulation attributed to a deficiency of thromboplastinogen in the plasma.

Differentiated from this classic form are the following types: hemophilia B (Christmas disease), attributed to a deficiency in the plasma of thromboplastin component; hemophilia C, due to a deficiency in the plasma of the thromboplastin antecedent, and other forms of hemophilia which may be caused by deficiencies in the factor IV (Spaet, Aggeler and Kinsell's factor), factor V (Hagemann's factor) or Stuart's factor.

In the case reported, a 21 year old man was admitted to the Mauriziano Hospital in Turin, Italy, because of an abnormally high body temperature (42°C.) and a large hematoma in the region of the lower right molars.

Since the age of seven years, he had experienced the sudden appearance of swellings in various joints, especially in the temporomandibular joint, and hemorrhages in the gingiva occurring spontaneously or after slight trauma.

During his stay at the hospital, the routine coagulation tests did not support the initial diag-

nosis of hemophilia A. Prothrombin generation tests, however, revealed an alteration in the thromboplastin formation process caused by a deficiency in the plasma of the thromboplastin component, thereby leading to the diagnosis of hemophilia B (Christmas disease).

The patient's family history showed only that one member (a cousin on the mother's side) had suffered from a delayed clotting of blood and consequent difficulties in checking hemorrhages after tooth extractions. In this instance, the temporomandibular joint also was included in the hemophiliac syndrome.

The personal history of the patient was more significant than his family history: he had often experienced hemorrhage and hemarthrosis in the oral cavity (sometimes without obvious causes) with a tendency to recurrence and delayed regression. The temporomandibular joint was most frequently affected causing an abnormal immobility of the joint.

Against this symptomatology suggesting hemophilia, there was the almost negative family history and the noncontributory results of the blood tests (tourniquet, bleeding and Quick's tests). The coagulation time was not abnormally prolonged.

Thromboelastograms were taken and a thromboplastin generation test was carried out. Both revealed definite changes in the thromboplastin formation time and in the fibrin formation rate. These phenomena are characteristic for hemophilia B, even in patients who show no abnormal coagulation time and a negative prothrombin consumption reaction.

Hemophilia B is inherited, as is hemophilia A. It is transmitted as a sex-linked recessive characteristic. The tendency to recurrence of hemorrhages in the temporomandibular joint and to painful oral hemorrhages, the importance of trauma as the causative (revealing or promoting) factor, and the appearance of the condition at an early age are symptoms common to both disease forms. From 10 to 30 per cent of hemophiliac patients have hemophilia B.

In dental and medical practice, the differentiation between these disease forms is important because the hemorrhages of the classic form can be stopped only by frequent transfusions of fresh blood, fresh plasma or plasma fractions containing antihemophilic globulin, whereas hemorrhages associated with hemophilia B can be checked by infusion of stored blood.

Mauriziano Hospital, Turin, Italy

Ptyalism and achlorhydria

P. W. Brown, Jr. *J.A.M.A.* 174:1657 Nov. 19, 1960

Although achlorhydria (absence of free hydrochloric acid in the gastric secretion) is known to accompany various diseases, definite evidence of a causal relationship between achlorhydria and ptyalism is lacking.

Experience with patients who have been achlorhydric for several years has provided conclusive evidence that achlorhydria itself does not cause symptoms in the oral cavity.

The salivary glands are known to secrete only in response to impulses transmitted by the autonomic nervous system. Ptyalism, therefore, should be considered as an expression of an increased autonomic nervous activity, and it is seen in patients who are experiencing various tension states and who usually exhibit other functional symptoms.

Being dependent on tension factors, ptyalism is almost invariably a temporary (but remittent) condition. Achlorhydria and ptyalism are unrelated.

Mayo Foundation, Rochester, Minn.

Roentgenology

Survey of exposure to ionizing rays of the Swiss population during dental and medical roentgen diagnoses

A. Zuppinger and A. Sauter. *SSO* 38:276 Sept. 1960

The Swiss Public Health Commission, recognizing the danger to public health created by exposure to ionizing rays during roentgenographic (diagnostic) examinations in dental and medical offices and hospitals or clinics, made a survey of the present radiation exposure of the entire Swiss population.

A questionnaire was mailed to all dentists and physicians and to the administrators of hospitals and clinics to determine the utilization of roentgen and other ionized irradiations on a nationwide basis.

About 80 per cent of dentists and physicians, and 85 per cent of hospital administrators responded promptly and thoroughly to the inquiry. The data received were evaluated at the Roentgen Institute of the University of Bern. It became evident that the radiation caused by dental and medical diagnostic roentgenography and by roentgenotherapy (in hospitals) constituted a substantial proportion of the total radiation received by the Swiss population. Although the exposure to ionizing rays of the entire Swiss population by diagnostic utilization of roentgenographic technics constitutes a predominant artificial source of irradiation, at present, the result for the individual patient (with the possible exception of pregnant women and preschool children) cannot be considered as being of significant genetic consequence.

The Commission is aware of the importance of and the necessity for the use of radiation in dentistry and medicine, but it insists on drawing the attention of the dental and medical profession to the fact that the use of ionizing rays should be reduced without diminishing the value of roentgenography and roentgenology for diagnostic and healing purposes.

The roentgen dosage distributed to the Swiss population at the present time for purely diagnostic purposes equals about one fourth of that of natural irradiation.

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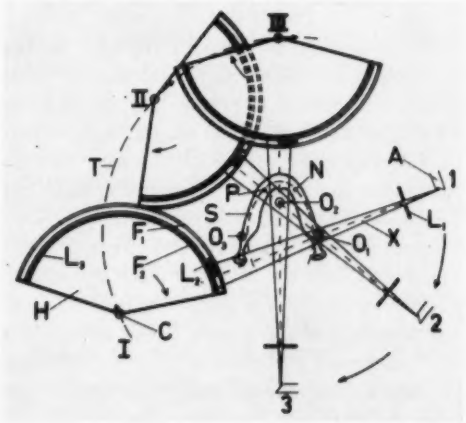
Stereoscopic orthopantomograms with a single exposure

Yrjö V. Paatero. *Odont. Tskr.* 68:339-343 Sept. 30, 1960

A stereoscopic orthopantomogram of the entire maxilla and mandible can be taken with a single exposure, utilizing a new apparatus, the Orthopantomograph.

According to the basic principle of pantomography, a sharp image only of that surface of an object along which a narrow roentgen-ray beam is moving with an equal velocity as the film, is projected on a linearly moving or rotating film. In the new method of orthopantomography, three rotational axes are used, but the basic principle still holds.

Figure 1 Schematic representation of the principles and function of the orthopantomograph in taking stereoscopic orthopantomograms of both jaws with a single exposure



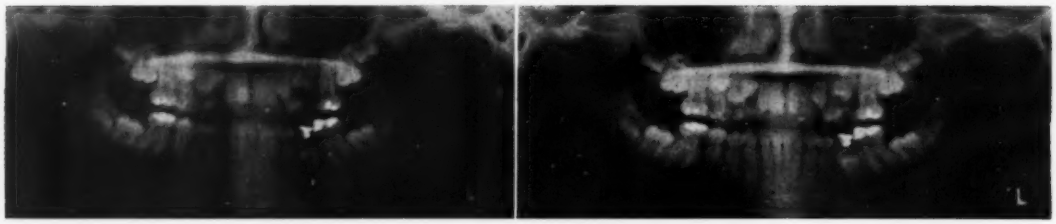


Figure 2 Stereoscopic view of the jaws of a 10 year old girl

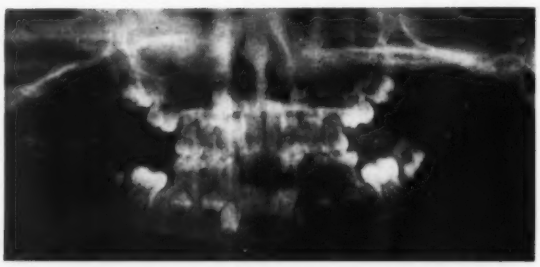


Figure 3 An ordinary orthopantomogram of the jaws of a 6 year old boy

Figure 4 Orthopantomogram of an adult with a large cyst in the right ramus

The procedure of taking stereoscopic orthopantomograms with a single exposure is schematically illustrated in Figure 1. At the starting point (the anode A of the tube at the position 1), the roentgen-ray beam X is aimed through the slit diaphragm L_1 at the rotational axis C of the cassette holder H. Two plastic cassettes with the films F_1 and F_2 are bent and attached to the holder. Between the cassettes there is a gap in which a vertical lead or brass strip L_2 is situated. The position I of the cassette holder corresponds to the position 1 of the source of rays. Because of the strip L_2, only the left half of the beam X can reach the inner film F_2 whereas the outer film F_1 is exposed to the whole beam. The left half of the beam X is absorbed by the lead sheet L_3 in the cassette holder after penetrating the film cassette.

While the tube moves from the position 1 to the position 2, the axis C of the cassette holder moves along the curvature T from the position I to the position II. The curvature T is a magnification of the dental arch S to be projected onto the films. The roentgen-ray beam has rotated about the axis 0_1 and the cassette holder about its axis C. The exposed areas of the films are marked with spots, and the arrows show the direction of the movements. In the position 1-II the central beam goes through the rotational axes 0_1 and 0_2 and the point P. The points P and N denote the places of the second bicuspids. At this moment the roentgen-ray beam begins to rotate about the front axis 0_2. When the central beam has reached the position 3-0_2-III, the halves of the films have been exposed, and, correspondingly, the left halves of the jaws have been projected onto the films. The movement continues until the whole maxilla and mandible have been roentgenographed. When the right side of the jaws are being reproduced on the films the beam X rotates about the axis 0_3.

The stereoscopic effect is dependent on the slightly oblique direction of the left half of the roentgen-ray beam. When looking at the stereo components stereoscopically, one can see the mutual position of the individual teeth. Figure 2 is a stereoscopic view of the jaws of a 10 year old girl, taken with a single exposure. If looked at by crossed eyes one may see the jaws from inside or from in front. Figure 3 is an orthopantomogram of the jaws of a 6 year old boy, and Figure 4 is an orthopantomogram of the jaws of an adult patient with a large cyst in the right ramus.

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Salivary gland tumors

George S. Sharp and James T. Helsper.
Calif.Med. 93:187-195 Oct. 1960

A series of 248 salivary gland tumors, seen over a 28 year period, was reviewed.

Of 187 tumors of the parotid gland, 44 (23.5 per cent) were malignant. Of 12 submaxillary gland tumors, 5 (41.7 per cent) were malignant. Of 49 tumors of the minor salivary glands, 24 (49.0 per cent) were malignant.

Patients with benign tumors ranged in age from 18 to 80 years; those with malignant tumors, from 22 to 84 years. The average age of all patients was 51.1 years. Sixty-one per cent of the patients were women.

Malignancy in a salivary gland tumor is characterized by a relatively short history, pain, large size of tumor, and, in instances of parotid tumors, by weakness or complete paralysis of the facial nerve.

The treatment of both benign and malignant tumors was primarily surgical. In some patients, roentgenotherapy was applied as an adjunct to primary surgical excision. Of particular value was the application of gold-filtered radon seeds or radium needles. In some patients, external and interstitial radiation was used with good results.

Of the 29 patients with parotid gland cancer who were observed for five years or more, 22 were living without evidence of disease.

Of three patients with malignant submaxillary tumors observed five years or longer, two were living without evidence of disease.

Of the 12 patients with minor salivary gland cancer who were observed five years or more, eight were living free of disease when last examined.

Pasadena Tumor Institute, 635 East Union Street, Pasadena, Calif.

Oxyphil cell tumor of submaxillary gland

John G. Batsakis and Douglas G. Martz.
U.S.Armed Forces M.J. 11:1383-1386 Nov. 1960

Oxyphil cell tumors of the salivary glands are extremely rare, and are even rarer in a salivary gland other than the parotid. An oxyphil cell tumor of the submaxillary gland is reported.

A 79 year old white man was admitted to the Walter Reed General Hospital because of a persistent left submandibular mass. The patient had noted a persistent asymptomatic enlargement in the left submaxillary gland region for the preceding 20 years. Eight months before his admission to the hospital, and after an upper respiratory infection, the mass gradually increased in size, with no associated pain or tenderness.

The 2 by 3 cm. mass was firm, freely movable and nontender. No drainage from the gland could be obtained by pressure. Roentgenograms revealed no calculi obstructing the duct.

Two days after admission, under general anesthesia, a hard, fibrotic, lobulated left submaxillary gland was removed. The specimen measured 5.5 by 3.0 by 2.5 cm. and weighed 15 Gm. The normal lobulated architecture of the anterior half of the gland had been replaced by a round, circumscribed, pink-tan tumor with scattered microcystic areas. No calculi were found. Microscopic examination revealed a well-circumscribed tumor, uniformly composed of large oxyphilic cells in solid masses and in an acinar arrangement. These cells contained abundant, finely granular cytoplasm and centrally placed, benign-appearing nuclei.

Hamperl (1936) asserts that oxyphil cells are associated with advancing age and consequent glandular atrophy. He observed such cells in all major and minor salivary glands and in other organs of the body. Tumors composed of oncocytic cells apparently are found only in patients above the age of 50 years.

It is not clear whether tumors formed by oxyphil cells are true neoplasms or a form of hyperplasia. Characteristically, such tumors follow a benign course and show no recurrence unless incompletely excised.

Walter Reed General Hospital, Washington, D.C.

Case reports

Surgical repair of a severed parotid duct: report of case

Harold E. Boyer. *J.Kentucky D.A.* 12:7-10 July 1960

A 29 year old Negro man was admitted to the oral surgery service at Jackson Memorial Hospital, Miami, Fla., with a painful swelling of the left cheek.

Three weeks earlier, the patient had received multiple facial lacerations, including a deep, S-shaped razor wound of the left cheek over the left zygomatic arch. The patient was treated at the hospital's emergency ward, where the wounds were debrided and sutured and the patient discharged. One week later the patient returned, complaining of a painful swelling of the left cheek. The swelling was diagnosed as an infected hematoma. On aspiration, dark blood was obtained. The patient was instructed to use hot soaks on the left side of his face. He was started on antibiotic therapy and discharged.

One week later the patient again returned with the same complaint. He was referred to the oral surgery clinic for consultation. Questioning revealed an increase both in the extent of the swelling and intensity of pain during mastication. A sialogram revealed a pooling of the contrast medium in the left cheek, confirming the tentative diagnosis of a severed parotid duct.

During surgery, the orifice of the left parotid duct was located intraorally and a probe inserted into the duct. The patient's head was rotated to the right and an incision made on the left cheek along the anterior border of the old scar extending in a semilunar shape for about 4 cm. The incision was carried through the skin, and about 10 cc. of a straw-colored fluid was immediately released from a superficial cavity. It was assumed that the fluid was parotid secretion that had accumulated as a result of the severed duct. The flap was retracted and the cavity visualized. It was 3 cm. in diameter. Along the anterior border of the cavity, the previously inserted intraoral probe was seen projecting through the retracted distal segment of the severed parotid duct. The proximal segment retracted into a mass of fibrous tissue, leaving a gap of about 2 cm. between the two segments. Both segments were dissected free and the cut ends freshened. A section of 19 gauge polyethylene catheter was passed into the proximal duct and into the parotid gland. As the catheter was passed, secretions from the gland could be seen climbing to a level in the catheter. The anterior end of the catheter was placed over the end of the probe and the catheter was directed through the distal segment of the duct as the probe was withdrawn into the oral cavity. The proximal and distal ends of the duct were approximated over the polyethylene catheter and sutured with no. 34 gauge stainless steel wire. The superficial cavity in the cheek was obliterated as the wound was closed in layers. Intraorally, the catheter was cut and sutured to the papillary orifice.

The postoperative course was uneventful. By the seventh postoperative day, the facial swelling had subsided completely and the facial incision had healed. Parotid secretions passed freely into the oral cavity through the polyethylene catheter. When the patient was next seen at the sixth postoperative week, he stated that he had removed the catheter the second postoperative week and that his progress had been excellent. On examination, the patient was found to have completely recovered. Parotid secretions were directed into the oral cavity through the repaired parotid duct.

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Contact glossitis from autopolymerizing resin splint

Homer S. Samuels. *U.S.Armed Forces M.J.* 11:1501-1504 Dec. 1960

A 25 year old patient was admitted to the U.S. Naval Hospital, St. Albans, N.Y., because of painful lesions on the gingiva and tongue. Four days before admission he had complained of pharyngitis, which subsided in two days. His temperature had ranged up to 101°F. Oxytetra-

Figure 1 Appearance of mouth with temporary poly(methyl methacrylate) splint in place. Note inflamed gingiva in vicinity of maxillary right incisors, and ulcers on tip of tongue. Figure 2 Splint removed. Note proximity of tongue lesion to area under treatment. Figure 3 Appearance 48 hours after removal of temporary splint. Figure 4 Appearance of tongue one month later and after insertion of permanent fixed bridge constructed of heat-cured, full veneer crowns on gold copings

cycline therapy for two days had produced no improvement, and he was referred to the hospital.

The midportion of the anterior dorsal third of the tongue was covered with multiple small, punched-out, yellow ulcers on an erythematous base (Fig. 1). The alveolar gingiva in the area of the maxillary right central and lateral incisors was extremely inflamed. The posterior two thirds and lateral borders of the tongue and the remainder of the oral mucosa were uninvolved. A temporary splint of poly(methyl methacrylate) had been inserted in the region of the maxillary right lateral and left central incisors, replacing a missing right central incisor.

Because the lesions were confined to the portion of the mouth in proximity to the temporary splint when the mouth was closed and in function, it was assumed that a chemical allergy or burn had occurred. The splint was removed (Fig. 2) and the patient was placed on general supportive therapy with mouth rinses containing a hot isotonic sodium chloride solution. The splint was taped to the patient's chest as an initial patch test, but this elicited no reaction.

By the following day, the patient experienced relief from the discomfort, and after 48 hours the oral condition showed dramatic improvement (Fig. 3). Three days after admission the patient was asymptomatic, afebrile and able to masticate a regular diet.

Later patch tests elicited no significant reaction of the skin or oral mucosa.

Although presumptive patch tests were negative and a reaction similar to the original glossitis could not be repeated in a test site in the patient's mouth, the location and distribution of the lesion strongly implicates the resinous material. Several factors may have been responsible. A likely factor is that of oral dehydration. The mouth may have been kept open and dry during preparation of the bridge abutment, so that the tongue was deprived of the diluting effect of the saliva and thus was more susceptible to irritants. Other variable factors are the ratio of monomer to polymer, total bulk of material used, and pH of the combined oral environment. The author assumes that the herpeticlike ulcers were caused either by the thermal heat of polymerization of the material in the temporary splint, or by an allergic response occurring under optimal conditions which could not be duplicated.

A heat-cured, fixed prosthesis, with full veneer crowns on gold copings, was inserted in the patient's mouth, and was well-tolerated (Fig. 4).

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Möbius syndrome: a congenital facial diplegia syndrome

John J. McDougal. *J.Connecticut D.A.* 34:4:21-28 Oct. 1960

Möbius syndrome is a rare congenital disorder manifesting facial nerve paralysis, most commonly bilateral and almost always total. Other structures may show concomitant involvement to a varying degree, such as those associated with the third, fifth, sixth, ninth, eleventh and twelfth cranial nerves. Such features as mandibular hypoplasia, atypical development of the deciduous teeth—needlelike in shape and with hypoplastic enamel—paralysis of the soft palate, clubfoot and localized muscular defects, especially of the pectoral regions, may be evident but are less frequent.

Expression and evidence of emotion on the patient's face are absent. The features are rounded and the skin smooth, with no trace of muscular furrows. There appears to be a withdrawn aura in the patient's response to his surroundings, such as falsely to suggest a mental sluggishness. The condition remains for life.

No case of Möbius syndrome has been reported in the dental literature. Congenital paralysis of the cranial nerves associated intimately with the orofacial regions warrants the attention of the dental practitioner.

The case reported is that of a well-developed six year old girl, brought by her mother to an eastern hospital dental clinic. The patient was expressionless, could not smile, and was unable to close her eyes completely; in brief, she had the classic major symptoms of the syndrome, including bilateral facial nerve paralysis and abducent nerve paralysis.

The hard palate was normal, with slightly increased arching, and all the muscular movements of the soft palate were normal. Only the upper and lower anterior teeth remained in the patient's mouth. The enamel was hypoplastic and the cuspids were needlelike in appearance. No permanent teeth were evident. The tongue, floor of the mouth, salivary orifices, oropharynx, gingiva, and muscles of mastication were normal. The child's vocabulary was good, and enunciation, though not always distinct, was adequate but with a nasal resonance.

The etiology of this disease is obscure. Some of the more common theories suggest that (1) the nuclei are congenitally aplastic or hypoplastic, or (2) that poorly developing peripheral structures can cause atrophy of the innervating nerve at the time the nerve is anticipated to grow into the peripheral region.

213 Kimberly Avenue, New Haven, Conn.

Leukoplakia buccalis: report of a unique case

Richard Diener. *Quintessenz* 11:17-18 Nov. 1960

A 21 year old woman was referred by her physician to the author for treatment of leukoplakia buccalis. According to the patient, the characteristic development of white, thickened patches on the mucous membrane of the cheeks had started 17 years ago, and year after year the lesions had involved more of the other areas in the oral cavity.

No pain sensation was experienced but a comparatively slight impediment in taste was present. The patient's main complaint was pain associated with eruption of a partially impacted upper left third molar.

Previously attempted oral treatments and vitamin injections brought no improvement.

Oral examination revealed the symptoms of a typical leukoplakia, the lesions beginning bilaterally in the region of the second molars and ending in the form of a stripe approximately 1 to 1.5 cm. wide extending from the masticatory surface to the angles of the mouth. The oral mucosa was slightly thickened and hyperkeratotically changed. The surface of the mucosa was fissured and yellow-gray. The condition had to be considered as precancerous.

No pathologic changes occurred in the dentition. There were no sharp cusps or edges of the teeth, and no signs of habitual biting of the inner cheeks. Trauma to the buccal mucosa by an unconscious but repeated biting caused by parafunction was not observed.

Roentgenographic examinations showed the presence of a partially impacted upper left third molar, probably in the stage of final (spontaneous) eruption. The molar was incompletely erupted but stood straight in the line of occlusion.

Both the upper right and the lower right third molars had not erupted, but there were no signs of impaction.

To eliminate all possible chronic irritations, all four third molars were extracted. Because of the presence of leukoplakia, neither conduction nor infiltration anesthesia could be used. The operation was performed under endotracheal (intubation) anesthesia. Postoperative roentgen irradiation was planned.

Unexpectedly, however, a significant improvement occurred almost immediately after the operation. Five weeks later, the buccal mucosa was intact and all symptoms of leukoplakia had disappeared. No further treatment was required.

Obviously, in this unique instance, the third molars although objectively and subjectively exerting no irritating stimuli, must have rendered the buccal mucosa in a state of overexcitation and hypersensitiveness. In all instances of leukoplakia buccalis, the dentist should take into consideration the condition of the third molars and decide whether immediate extraction of these teeth is indicated.

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Unpleasant salty taste in the mouth

A. Kressner. *München.med.Wschr.* 102:1992 Oct. 7, 1960

A 52 year old woman complains of a persistent salty taste in the mouth which has impaired adequate food intake, thereby creating unfavorable effects on her general health and well-being.

Examinations by an internist and a neurologist failed to reveal the cause. These negative findings seem to exclude the presence of a systemic disease, although salty taste in the mouth is an early symptom of pernicious anemia.

Any type of impairment or alteration of the sense of taste, however, may be caused by ill-fitting dentures which produce pain, ulceration, inflammation and abnormal excretion in the oral cavity. Side effects of drugs may also cause the salty taste as do certain chemotoxical processes produced by the presence of different metals in one mouth.

Periodontosis, chronic infections of the salivary glands or chronic tonsillitis may produce innate reflexes in the taste sensation promoted by the sight of food or by smell.

Changes in the taste sensation occur in vitamin deficiencies (vitamin A, C or B complex) and in hormonal disturbances (occurring during the menopause).

Without ascertainment of the possible causative factor (or factors), no treatment should be attempted to eliminate the salty taste in the mouth or halitosis.

In the case reported, ill-fitting dentures and a mild avitaminosis were the main causative factors; after insertion of a new set of complete dentures and addition of vitamins A and B complex to the diet, the salty taste in the mouth disappeared.

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Bacteriology

Bacterial invasion of blood following oral surgical procedures

Alexander Schirger, William J. Martin, R. Quentin Royer and Gerald M. Needham.
Proc.Mayo Clin. 35:618-622 Oct. 12, 1960

The incidence of bacterial invasion of the blood of patients undergoing oral surgical procedures at the Mayo Clinic who had not received any antibiotic beforehand was compared with that of patients who were given phenoxymethyl penicillin by mouth prior to operation.

Group A consisted of 50 patients who received no antibiotic before operation. Group B consisted of 50 patients who received two tablets of phenoxymethyl penicillin (each tablet containing 500,000 units or 300 mg.) at intervals of about six hours for a total of four doses preceding the operation, which was undertaken about four hours after the last dose. Group C consisted of 27 patients who received one tablet of phenoxymethyl penicillin also every six hours for four doses preoperatively. Samples of blood for cultures were obtained from all patients immediately after surgery, and another sample was obtained 18 hours later.

Twenty-seven of the 50 untreated patients in Group A had positive cultures of the blood obtained immediately after oral surgery. Ten of these positive cultures grew *Streptococcus mitis* and one yielded *Staphylococcus pyogenes* var. *aureus*. Eighteen hours after operation the blood of all these 27 patients was negative for bacteria.

Eight of the 50 patients comprising Group B had positive cultures of blood drawn immediately after operation. Eighteen hours after operation, the blood of all eight was negative for bacteria. However, the blood drawn at 18 hours after operation from three other patients in this group grew organisms even though cultures of blood of these patients were negative at operation.

Five of the 27 patients in Group C had positive cultures from the blood obtained immediately after operation. One of these cultures yielded *Str. mitis*. None of these five had positive cultures of blood drawn 18 hours after operation. Four additional patients in this group of 27, however, had positive cultures of blood drawn 18 hours after operation even though the cultures made immediately after operation were negative.

The data appear to corroborate the findings of others, in that a significantly greater number of positive blood cultures occurred in the group of patients who did not receive penicillin prior to oral surgery.

It is of interest that all patients with positive cultures of blood drawn immediately after operation had negative cultures of blood obtained 18 hours after the procedure. Although this finding seems to indicate that bacterial invasion of the blood after oral surgical procedures usually is a transient phenomenon, it does not follow that such a phenomenon should be treated lightly.

It appears that phenoxymethyl penicillin is at least as effective in the dosage schedule employed as is parenterally administered penicillin G employed by other investigators.

The observations in Group B suggest that when 4,000,000 units of phenoxymethyl penicillin is to be given by mouth, this treatment need not begin until 24 hours before operation rather than 48 hours beforehand. The observations further indicate that for prophylaxis, penicillin may be given in the phenoxymethyl form by the oral route.

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The possible role of hyaluronidase in the incipient carious lesion

Ralph R. Steinman. *J.South.California D.A.* 28:207-209 July 1960

Among the histochemical changes in tooth structure which precede cavitation are a pronounced increase in permeability, an increase in reducing agents and a possible depolymerization of the mucopolysaccharides. Such changes are typical of those produced by hyaluronidase in other tissues. This study was undertaken to investigate the pos-

sible role of bacterial hyaluronidase in the pathogenesis of the incipient carious lesion.

Seventy Osborne-Mendel rats from eight litters were divided into two groups at 18 days of age. Thirty animals were placed on a cariogenic diet, and 40 animals received the same diet, to which was added 1 per cent by weight of an antihyaluronidase made by the method of Rogers and Spensley (1954). At 28 days of age all animals were sacrificed and the teeth examined histochemically.

Nine animals receiving the antihyaluronidase died before the end of the experiment. The 31 surviving animals in the experimental group had an average of 0.8 incipient carious lesions per animal, whereas the 30 animals in the control group had an average of 4.09 incipient lesions per animal.

The results suggest that hyaluronidase of bacterial origin may play a part in the production of the incipient carious lesion by making the first line of defense of the tooth—the relatively impermeable natural covering—more permeable to noxious bacterial agents.

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Studies of a factor in urine promoting the growth of teeth

Yoshio Sasaki. *Shikwa Gakuho* 60:18-37 Oct. 1960

On the hypothesis that urine may contain a factor which promotes the growth of the teeth, the author injected 1, 2 or 4 cc. of human urine daily for ten days into mature rabbits. When the findings in the three groups of rabbits were compared to those in control groups, it was observed that daily injections of 1 cc. urine promoted growth of the teeth, but that injections of 2 cc. and 4 cc. suppressed tooth growth. The results were similar to those obtained with injections of saliva.

Human urine then was broken down into several elements and each element injected in turn in rabbits. The active element in human urine which promotes tooth growth is uroparotin, which is analogous to parotin in saliva.

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Diagnostic and prognostic significance of variations in the serum levels of specific glycolytic enzymes and aminopherases in patients with oral tumors or Hodgkin's disease

S. Esposito and L. Petronio. *Minerva med.* 51:1701-1707 Aug. 1960

The serum levels of specific glycolytic enzymes such as aldolase, lactic and malic dehydrogenase and of aminopherases such as glutamic-oxalacetic and glutamic-pyruvic aminopherase were determined in 34 patients with variously localized oral tumors and in 10 patients with Hodgkin's disease.

The determinations were made before, during and after radium irradiation or roentgenotherapy.

The obtained results led to the conclusion that a high serum level of these enzymes in patients not having undergone any previous treatment can be considered as a general but not unequivocal symptom of malignant change. An extremely high enzymatic activity in the serum during treatment indicates the presence of metastases, whereas a biphasic aspect in the curves of enzymatic activity in the serum indicates a favorable prognosis, especially for patients with Hodgkin's disease in the radiosensitive phase.

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Dentistry around the world

The future of dentistry in Australia

Editorial. *Austral.D.J.* 5:225-226 Aug. 1960

Dentistry in Australia has entered an age wherein dentistry is set on a biological basis, and the aim of prevention, both as an individual matter and as a public health measure, is gaining wide acceptance. The curriculums of our dental schools are constantly changing to keep pace with advances of knowledge.

The Australian practice of dentistry is being modified as a result of those changes and through the impact of young graduates in practice, and the dissemination of knowledge at scientific conventions, lecture programs, conferences and discussion groups of specialists' societies, postgraduate courses, the dental literature, visiting authorities and overseas travel, plus the work of the Commonwealth Bureau of Dental Standards, the Standards Association of Australia and the Institute of Dental Research.

However, other changes appear to be taking place in our community, arising from social pressures. There are signs which lead to the conclusion that dentistry is not fully appreciated. Certainly this is so in some areas of Australia where limited prosthetic services can be rendered directly to the public by dental technicians. Allegedly such a state of affairs has developed because of the desire on the part of dental technicians to provide dentures to the public at costs lower than for those made by dentists. Announcements by the Premier of New South Wales indicate that his government will introduce legislation to enable dental technicians to provide complete dentures for members of the public.

Those who support legislation which permits such practices in the belief that they will be a boon to the community have been misinformed and demonstrate their inability to understand the community's dental problems.

The problems of the private dental practitioner are varied and cannot be solved by a rigid set of rules. They include such matters as the use of auxiliary staff and services, methods of payment for services, the impact of dental health education on the public, dentist-population ratios, the opportunities for specialization and for continuing education, the continuity of recruitment to the profession, the distribution of socioeconomic groups in the community, and the motivation of people of all social strata in seeking dental health services.

The enormous growth of postpayment or deferred payment systems for services and goods demands a study of the application of their principles to dental treatment.

Under the auspices of the Carnegie Foundation in 1926, William J. Gies carried out a monumental study on the status of dentistry in the United States, and the American Dental Association is participating in a two year study being undertaken for the American Council of Education, at a cost of $400,000. The results of this survey will be awaited with interest. But each community has its own particular characteristics and problems. It is important that we in Australia have not only an informed profession but that responsible leaders in the community will be aware of the magnitude and importance of our problems. It is essential to have information with which we can advise various governments. We have not the financial resources comparable with those of the American project, but for our own security the future seems to demand more support from the members of the profession and above all to demand a united profession.

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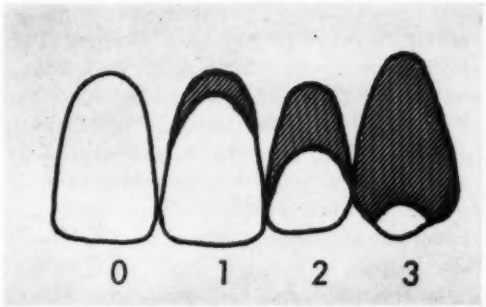

Figure 1 Diagram showing varying amounts of oral debris with scores based on tooth surface area covered

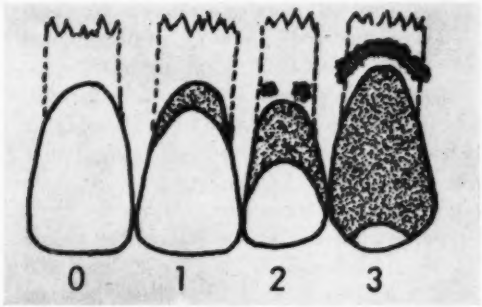

Figure 2 Diagram showing varying amounts of supragingival and subgingival calculus with scores based on tooth surface area covered

Public health dentistry

The oral hygiene index: a method for classifying oral hygiene status

John C. Greene and Jack R. Vermillion. *J.A.D.A.* 61:172-179 Aug. 1960

A simple quantitative expression of oral cleanliness which is based on clearly defined criteria and which reduces examiners' variations to a minimum is needed. Such a tool would be useful when studying the epidemiology of periodontal disease and oral calculus, when assessing toothbrushing efficiency, or when evaluating the dental health practices of a community and the effects of dental health education. The authors have developed an "Oral Hygiene Index" for quantifying individual and group oral hygiene status.

The Oral Hygiene Index is composed of the combined "Debris Index" and "Calculus Index." Each of the two latter indexes is based on 12 numerical determinations representing the amounts of debris or calculus found on the buccal and lingual surfaces of each of three segments of each dental arch: (1) the segment distal to the right cuspid, (2) the segment distal to the left cuspid and (3) the segment mesial to the right and left first bicuspids. Separate recordings are made for the buccal and lingual surfaces.

The individual indexes are derived from scores based on the fraction of tooth surface area covered by debris or calculus.

The scores and criteria for oral debris (Fig. 1) are:

0—No debris or stain present.

1—Soft debris covering not more than one third of the tooth surface, or the presence of extrinsic stains without other debris regardless of surface area covered.

2—Soft debris covering more than one third, but not more than two thirds, of the exposed tooth surface.

3—Soft debris covering more than two thirds of the exposed tooth surface.

The scores and criteria for oral calculus (Fig. 2) are:

0—No calculus present.

1—Supragingival calculus covering not more than one third of the exposed tooth surface.

2—Supragingival calculus covering more than one third, but not more than two thirds, of the exposed tooth surface or the presence of individual flecks of subgingival calculus around the cervical portion of the tooth or both.

3—Supragingival calculus covering more than two thirds of the exposed tooth surface or a continuous heavy band of subgingival calculus around the cervical portion of the tooth or both.

The scores for debris and calculus are tabulated separately and indexes for each calculated independently, but in the same manner.

The Oral Hygiene Index was evaluated in a field trial in which 577 white boys, aged 11, 13, 15 and 17 years, were examined in the public schools of Atlanta, Ga. Less than four minutes were required per subject for recording the scores for periodontal disease (based on the system developed by Russell in 1956), oral debris and calculus, and for an interview eliciting information relating to toothbrushing habits.

The field trial demonstrated an inverse relationship between oral hygiene scores and toothbrushing frequency, and a positive correlation between the Debris, Calculus, and Oral Hygiene Indexes and Russell's Periodontal Index. The Oral Hygiene Index was more closely associated with the periodontal scores than were either of its two component indexes. The Oral Hygiene Index appears to be a sensitive, simple method for assessing group or individual oral hygiene quantitatively.

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Dental surveys in relation to nutrition

Albert L. Russell, Norman W. Littleton, Ernest C. Leatherwood, Gunnar E. Sydow and John C. Greene. *Pub.Health Rep.* 75:717-723 Aug. 1960

Although the relation between dental caries and the nutrition or diet of the individual or of the population group in which he has been found has received a great amount of study, no consistent association of dental caries with a deficiency of any known nutrient has been established.

In the series of five surveys reported, an effort was made to discover whether relationships exist between oral status in the groups studied and the physical, biochemical or dietary findings.

In Alaska, 713 members of the Alaska National Guard, ranging from 17 to 54 years, residing in 55 villages, and representing about one of each five or six Alaskan Eskimo males in the total adult population, were examined. There were extreme variations in dental caries prevalence, associated loosely with place of residence. Men from the principal centers of population averaged 14.5 DMF teeth, whereas the average in men in more remote villages was 7.1, and in those from the Yukon-Kuskokwim delta region, 2.3 DMF teeth per person. Despite the almost universal presence of oral calculus and debris, men from many of the villages showed little tendency toward the formation of periodontal pockets or loss of alveolar bone.

In Ethiopia, 1,085 civilians ranging in age from 5 through 84 years were examined. Seventy-seven per cent were free of dental caries, and persons under 40 years of age averaged less than one DMF tooth per person. No individual in the sample was completely edentulous, and only seven persons had received restorative dental care. In contrast to the low prevalence of dental caries, the prevalence and severity of gingival and periodontal diseases were relatively high. The usual clinical finding was one of moderate to severe gingival inflammation with widespread periodontal pocket formation after the age of about 30 years. Abundant deposits of soft debris and calculus were present about the teeth in virtually all mouths examined.

In Peru, 1,500 members of the armed forces in military installations in seven geographic areas were examined. Persons from the southern Sierra averaged about one fourth to one fifth of the dental caries that might be expected from a comparable age group in a low fluorine area in the United States. The cereal quinoa, an excellent source of natural proteins, is a typical dietary item in this area. The possibility that quinoa may have caries-inhibiting properties currently is under investigation through animal experimentation conducted at the National Institute of Dental Research in Bethesda, Md. Periodontal conditions of the subjects examined in Peru approximated those reported for persons with eight years of school or less in Birmingham, Ala. Recession of the gums was seen so rarely under the age of 25 years that it was not tabulated. No instances of functional malocclusion were observed.

In Ecuador, 4,975 civilian and military personnel from each of the nation's 18 provinces were examined. Dental caries prevalence in the whole population group did not differ greatly from prevalence levels reported for Baltimore, Md. How-

ever, a strikingly low caries prevelance was found in the Jivaro Indians living in the eastern jungle. The 52 Jivaros examined, averaging 26.5 years of age, had a mean of 1.25 DMF teeth. Periodontal disease scores for all persons examined were higher than those recorded for equivalent ages in the 1954 Baltimore study.

In Vietnam, 3,700 civilian and military personnel were examined. Dental caries prevalence was low, only slightly higher than that reported for Ethiopians. Periodontal disease was universally prevalent, and particularly severe and destructive in mountain tribesmen of villages in the central highlands.

No consistent patterns of association between nutrition and oral status were developed in these data. Lowered caries prevalence in Ecuadorian adults was related to optimal or high intakes of fluorine. Caries prevalence levels generally were low by United States standards, and the prevalence and severity of periodontal disease were correspondingly high.

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Relative incidence of caries in the different deciduous teeth

Usha Sehgal. *J.All India D.A.* 32:224-229 Oct. 1960

Massler (1958) stated that the usual sequence of the caries attack in the deciduous dentition was, in descending order, as follows: lower molars, upper molars and upper anterior teeth (seldom the lower anterior teeth).

To survey the relative incidence of caries in the deciduous dentition of children in Bombay, India, 1,468 school children were examined.

The order of susceptibility of the deciduous teeth to caries, in descending order, was as follows: lower second molar, upper second molar, lower first molar, upper first molar, upper central incisor, upper lateral incisor, upper cuspid, lower cuspid, lower lateral incisor and lower central incisor.

The order of susceptibility was the same in boys as in girls. In these children, more than 70 per cent of the first and second deciduous molars, both upper and lower, were affected. The incidence in upper central incisors was slightly more than 50 per cent.

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Incidence of dental caries in German school children

W. Franke. *Med.Klin.* 55:1782 Sept. 30, 1960

In children, the most serious effects of dental caries occur in the occlusal and proximal tooth surfaces. However, carious lesions are frequently observed in the smooth tooth surfaces where the factor of food accumulation would seem unlikely to cause any influence on caries development. In some children pits and fissures predominate in the dentition, whereas in others proximal cavities appear almost exclusively.

In German school children, these conditions occur far more frequently than could be expected by a normal variation in cavity locations. In dental examinations of 111,000 children attending the elementary schools of the West German state North Rhine-Westphalia, carious lesions were found in 80 per cent of the deciduous teeth, and in 90 per cent of the permanent teeth. In the state of Bavaria, where school dental service has been less developed, only 0.5 per cent of the deciduous teeth and 2.9 per cent of the permanent teeth were free from caries.

An important factor in the development of caries in German school children is related to the gingival margin, where specific white lines on the tooth surfaces appear almost simultaneously with tooth eruption. These white lines, extending along the tooth's circumference, demonstrate weaknesses in the tooth structures, and cavities form more frequently at the sites where these white lines appear.

Anomalies, accidents and neglect of oral hygiene and nutrition will continue to require increasing dental care in German school and preschool children, whether by prosthodontic, pedodontic, endodontic, periodontic or orthodontic procedures.

The German Public Health Authorities are advised to emphasize school dental service, oral hygiene and a dietary regime consisting of an almost complete absence of sugar, white flour,

sweets, biscuits and cakes, but rich in raw vegetables and fruits, fish and milk, and to initiate immediately a scientific evaluation of fluorine (either fluoridation of water supplies or topical application of stannous fluoride or chlorofluoride) as a means to reduce the incidence of caries.

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Sodium fluoride tablets for children

Francis A. Arnold, Jr., F. J. McClure and Carl L. White. *D.Progress* 1:8-12 Oct. 1960

Tablets containing 2.21 mg. of sodium fluoride (1.0 mg. of fluorine) were taken by 121 children whose parents were physicians, dentists or other professional employees of the U.S. Public Health Service. These children and parents were deemed capable of following instructions consistently and exactly. Most of the families lived in the Washington, D.C. area. Some of the children began receiving fluorine soon after birth, and the majority began to use fluoride tablets before six years of age.

Home water supplies whose fluorine contents were unknown were analyzed before the fluoride tablet regime was started. A three-month supply of tablets was given to each family, and they were asked to request more when the original supply was nearly gone. Instructions for use of the tablets were:

Children 0 to 2 years old: Make up all water added to any formula and used for drinking purposes, by dissolving one tablet in one quart of water.

Children 2 to 3 years old: Give one tablet every other day. This tablet may be taken directly with water, or dissolved in a glass of water, milk or fruit juice. To be certain the tablet is completely dissolved, place it in a glass with a tablespoon of water, crush and stir until it is completely dissolved. Milk, fruit juice or water may be added to make a full glass. Stir the liquid.

Children 3 to 10 years old: Give one tablet daily, as directed above for 2 to 3 year old children.

Exfoliated deciduous teeth were analyzed for fluorine content.

The mean numbers of def and DMF teeth of the 121 children who took the fluoride tablets every day for an average of two-thirds of their lives, were comparable to def and DMF data previously reported for children of similar ages who drank fluoridated water or water containing optimum quantities of natural fluorine.

The regimen did not result in dental fluorosis of cosmetic significance. The mean fluorine content of deciduous teeth of children taking the tablets was significantly higher than that of teeth of children in a nonfluorine area. The fluorine content of deciduous teeth increased slightly and proportionally with the length of time the sodium fluoride tablets were taken.

Although this study indicates that fluoride tablets seem to be an effective means of controlling caries, water fluoridation remains a more practical and dependable procedure in large population groups.

National Institute of Dental Research, Bethesda, Md.

Cooperation between dentists and physicians in the prevention of dental caries

Martin Herrmann. *Med.Klin.* 55:1783-1784 Sept. 30, 1960

Exogenous factors influencing the development of dental caries can be eliminated therapeutically only by dentists. However, physicians in cooperation with dentists can exert an influence on endogenous factors that affect the individual susceptibility to caries, especially in children.

The chemical synthesis of the hard tooth substances seems to decide more than any other factor the degree of the individual susceptibility or resistance to caries. Systemic diseases such as syphilis, erythroblastosis, avitaminoses during pregnancy as well as rickets promote the development of structural defects during the synthesis and histogenesis of enamel, dentin and cementum.

During pregnancy, the physician may administer vitamin D (ergosterol), vitamin D_2 (calciferol) or fluorine (in water, salt or milk) as therapeutic adjuncts to the optimal diet, which also should be rich in milk and milk products, fresh (green) vegetables, raw fruits, eggs or fish

but low in meat and meat products (sausages), saccharides (sugars and sweets) and carbohydrates (cereals or white flour).

Certain types or specific amounts of dietary proteins, however, also influence the susceptibility to caries; a deficiency of lysine lowers the resistance significantly. Animal experiments have demonstrated that if lysine is not present in the saliva, the incidence of caries is increased. In the etiology of caries in humans, however, many additional factors are involved.

In prevention of caries, cooperation between dentists and physicians becomes most essential in the education of the general public on dental and general health procedures.

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Observed differences of total caries experience among white children of various socioeconomic groups

Louis F. Szwejda. *Pub.Health Den.* 20:59-66 Fall 1960

In the 1959 dental survey of school children in Buffalo, N.Y., white children were separated into three socioeconomic groups—low, average and high. Schools were selected to assure adequate socioeconomic samples. Selected schools included three public high schools, four parochial high schools, 12 public elementary schools and nine parochial elementary schools. Children of kindergarten, third, sixth, ninth and twelfth grades were examined. Dental caries experience in both the deciduous and permanent dentitions was compared at various ages. A remarkable consistency was observed in differences of age-specific DMF rates.

Children residing in the high economic areas of Buffalo showed the lowest dental caries experience. Conversely, children from housing tracts in the low economic areas exhibited the highest DMF rates. Dental caries experience of children at the average economic level of Buffalo fluctuated generally between the caries rates of children from the low and high socioeconomic areas.

At age six, Buffalo children of high economic level had about 31 per cent fewer DMF permanent teeth than children of the low economic areas. The deciduous teeth of children five, six and eight years old followed the same pattern. Through all the ages studied, children residing in the "most desirable" housing areas showed up to 20 per cent less total caries experience than children of low economic level. At age 14 there was the least difference in caries rates between the low and high groups; at that age the children in the average socioeconomic group had a higher DMF rate than the children of the low socioeconomic group.

The greatest unmet dental needs were present in the children of the low socioeconomic group.

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Dental health in the aging

John E. Zur. *J.Am.Podiatry A.* 50:979-980 Dec. 1960

According to information gathered in 1957 and 1958 in a National Health Survey of the civilian noninstitutionalized population, only 18.8 per cent of persons 65 years old and over had visited a dentist during the preceding year, as compared to 36.5 per cent for the age group 45 to 64 years old. More than half of the older age group had not been to a dentist for five or more years. Family income and education level had a direct bearing on the percentage of persons 65 and over who visited a dentist in the preceding year. About 56 per cent of persons 65 to 74 years old were completely edentulous.

In a study of nursing home patients in Kansas City, it was found that the average age of patients was 75 years, and that 61 per cent of the patients were completely edentulous. Two thirds of the edentulous patients had dentures. Of the dentulous patients in the Kansas City nursing homes, 90 per cent had periodontal disease, 44 per cent needed extractions, 31 per cent needed upper and lower dentures, and 24 per cent needed restorations. Yet treatment was recommended for only 37 per cent; 35 per cent were considered untreatable for physical, mental or other reasons.

A survey by the American Dental Association's Bureau of Economic Research and Statistics, covering 4,000 dentists and about 40,000 patients, showed that, for patients 65 years old and over, more than three times as many teeth were indi-

cated for extraction because of periodontal disease than because of caries. One fourth of the patients 65 years old and over needed upper and lower complete dentures. Only 8 per cent of the patients in this age group required no dental care other than prophylaxis.

Even edentulous persons have unmet needs for dental care. They may require original or replacement dentures, repairs for old dentures, minor adjustments or perhaps relining of loose dentures.

Periodic oral examination for cancer detection is important in this age group. The Illinois Bureau of Vital Statistics reported that during the five-year period from 1955 through 1959, oral cancer caused an average of one death per day in Illinois.

Although the dental needs of the aged are great, factors which would limit a practical program of care include physical and emotional conditions, mental attitude toward professional care, and monetary considerations.

The total health care of the aged calls for joint effort among all the health professions.

Illinois Department of Public Health, Springfield, Ill.

Practical politics and public health: how a fluoridation referendum was won

Thomas F. A. Plaut. *Harvard Pub.Health Alumni Bul.* 17:2:6-9 Dec. 1960

In November 1953 the citizens of Cambridge, Mass., defeated a proposal to fluoridate the municipal water supply, by a vote of 20,194 to 13,933. In November 1959 the same proposal again was on the ballot, and the citizens approved fluoridation by a vote of 16,069 to 16,027. What brought about this change from a resounding defeat—by 6,259 votes—to a narrow victory six years later?

In 1958 a member of the Cambridge School Committee asked that the condition of the teeth of all Cambridge school children be surveyed. Such a study was authorized, and undertaken by the Cambridge Health Department in the spring of 1959.

In January 1959 a small group, arising out of the monthly sessions of the Health and Hospital Division of the Cambridge Community Services, began to meet to discuss the possibility of placing the fluoridation issue on the ballot again. In July it was decided to work toward another referendum. The group, consisting of physicians, dentists, housewives, community leaders and one or two elected city officials, called itself "The Cambridge Committee on Better Teeth for Our Children."

Massachusetts law provides that the water board in any community may ask that fluoridation be placed on the ballot. The Water Board was persuaded to take this step, after it had been presented with a petition signed by 54 Cambridge dentists, and after scores of telephone calls, personal contacts and a public hearing.

Eight weeks before election day, when it was settled that fluoridation would be on the ballot, the fluoridation committee was expanded to include a well-known public health physician, a bank president, an ex-governor, an ex-mayor, a city councillor, a professor of engineering, several women active in community affairs, two dentists, a pediatrician and the health officer of Cambridge.

Educational material was prepared, workers recruited, and funds raised for a city-wide campaign. A small number of women, mostly the wives of professional men, contributed many hours of work. Excellent relations were established and maintained with the editor of the one local (weekly) newspaper, who published many letters on each side of the fluoridation question, and supported fluoridation editorially.

A member of the fluoridation committee talked personally to about half of the candidates running for election to the city council and the school committee. Whereas in 1953 candidates were afraid to support fluoridation, it appeared in 1959 that a number of candidates were afraid to oppose fluoridation.

A month before the election, the results of the dental survey were made public. It indicated the extremely poor condition of the teeth of Cambridge school children.

The fluoridation committee secured favorable coverage of the fluoridation issue in the major Boston newspapers. Although opponents of fluoridation, in 1953 and in 1959, tried to create the impression in Cambridge that the Catholic Church was opposed to fluoridation, the Boston archdiocesan newspaper in both referendums printed stories favorable to fluoridation.

On the weekend before the election, a special fact sheet on fluoridation was distributed to almost all of the city's 30,000 households.

The generally unexpected victory of the fluoridation group in Cambridge was quickly noted by public health workers in other communities in the Boston area. Already, groups in several communities have organized and begun work toward local fluoridation referendums at the next election.

Harvard School of Public Health, Cambridge, Mass.

The effect of stress upon the incidence of dental caries

Ralph R. Steinman. *J.South.California D.A.* 28:367-369 Nov. 1960

Twenty-four Osborne-Mendel rats from three litters were weaned at 21 days of age and placed on a cariogenic diet *ad libitum*. At 28 days of age the animals were divided into two equal groups. One group was placed in a large cage which allowed space to run. Four hours a day these animals were placed in a rotating cage which caused the animals to exercise for 16 minutes and rest for 8 minutes. The other group of 12 animals was restricted by being placed within wire cages which allowed no freedom of movement. Food and water were available to both groups at all times.

All animals were sacrificed at 42 days of age, and the jaws removed and the teeth examined for caries.

The animals which were confined had a significantly higher incidence of caries than did the animals not confined. The 12 confined animals had 179 carious lesions, an average of 14.9 lesions per animal. The animals which had exercise and freedom to move had 71 lesions, an average of 5.9 lesions per animal.

In a second experiment, similar in most details to the first, the first group of nine animals was placed in a large cage which allowed room for exercise and freedom of movement. The second group of nine animals was confined for the duration of the experiment in cages which allowed no freedom of movement. The third group of nine animals also was confined in the same type of cage for 20 hours a day, but four hours a day these animals were removed from the restricted cages and exercised in a rotating cage. All animals were sacrificed at 35 days of age.

The nine animals in the control group (room for exercise) had 43 carious lesions, an average of 4.8 lesions per animal. The nine animals constantly confined had 124 lesions, an average of 13.7 lesions per animal. The nine animals confined and exercised had 119 lesions, an average of 13.2 lesions.

The stress of physical restraint significantly increased caries susceptibility in young rats. This susceptibility was not reduced significantly by the addition of some exercise to the confined young rats.

School of Dentistry, College of Medical Evangelists, Loma Linda, Calif.

Dental caries experience of mongoloid children

N. P. Johnson, M. A. Young and J. A. Gallios. *J.Den.Children* 27:292-294 Dec. 1960

The incidence of caries in 106 mongoloid children at the Dixon State School, Dixon, Ill., was compared with the incidence in 106 nonmongoloid, congenital mental defectives. The mongoloid children averaged 2.18 decayed and filled deciduous and permanent teeth per 100 teeth examined. The mentally defective children averaged 8.28 decayed and filled deciduous and permanent teeth per 100 teeth examined.

The institutional diet was nutritionally adequate. It was semisolid, and the amount of fermentable carbohydrates was as high as in the diet of the average American. Three meals were served each day. Snacks between meals were rare. Oral hygiene measures were practically nonexistent among all the children examined. The incidence of periodontal disease was high.

The mongoloid children showed a much lower caries attack rate than the matched group of nonmongoloid children with other forms of congenital mental defects. This difference was apparent in children both before and after admission to the institution. Caries experience was decreased still further after institutionalization of mongoloid children but was increased in children with other mental defects.

Dixon State School, Dixon, Ill.

Chronic fluorine poisoning and osteomyelosclerosis

H. Hornung. *Deut.med.Wschr.* 85:1940-1941 Oct. 28, 1960

Programs to reduce the incidence of dental caries by fluoridation of water supplies have been successful in the United States where more than 35,000,000 inhabitants are supplied with fluoridated drinking water. In Europe, however, the fluoridation programs in several countries still meet resistance despite the resolution of the World Health Organization of 1957 that "the fluoridation of drinking water is an effective, practical and harmless procedure."

The opponents of fluoridation, who are as active in Europe as in the United States, still publish biased criticisms of fluoridation in the dental and medical literature. The representative of this opposition in both continents is the Detroit dermatologist, Dr. Walbott, whose assertions and conjectures seem to have been given less attention by physicians, dentists and public health officers in the United States than in Europe, including the West German Federal Republic. Recently, other authors have followed Walbott's footsteps. H. Odenthal and H. L. Wieneke reported recently a case of "chronic fluorine poisoning and osteomyelosclerosis" in the *Deutsche medizinische Wochenschrift* which has been reprinted in other journals and has been quoted frequently by other opponents of fluoridation.

Odenthal and Wieneke described a man who worked in a waterworks which processes (according to the authors) drinking water containing 7.5 ppm fluorine (fluoride ion). This man was examined by the authors who diagnosed his condition, "coarse trabecular structures, thickening of the osseous framework, and enlargement of the liver and spleen," as "hydrofluorosis associated with osteomyelosclerosis." This syndrome occurred only in this individual despite the fact that an entire community (Weibern, District of Mayen in Rhineland) has consumed the same water for many years. The public health department of Rhineland could not find another instance of this mysterious disease in any other employee of the waterworks or in any inhabitant of the community who had consumed the drinking water containing fluorine naturally.

Walbott's theory, that the case in question was caused by an individual hypersensitivity to fluorine, was supported by Odenthal and Wieneke. Similar instances, however, were not found in Bartlett, Texas, a community with drinking water containing 8 ppm fluorine. Roentgenographic examinations of the inhabitants of Bartlett revealed neither the presence of "hydrofluorosis" or "osteomyelosclerosis" but changes in bone structure associated with the aging process.

All previously published reports of pathologic bone changes presumedly caused by fluorine, especially those by Hoffmann-Axthelm (1959) and Steinberg and co-worker (1958) are in direct contradiction to Odenthal and Wieneke's findings.

This report, therefore, should not be used to oppose the addition of fluorine to the water supplies of the West German Federal Republic; these drinking waters contain an average of from 0.1 to 0.4 ppm, and the optimal 1.0 ppm fluorine desired by the proponents of fluoridation will cause no danger.

A recent re-examination of the drinking water of Weibern has revealed that the water processed in this plant contains not 7.5 ppm fluorine but only 0.75 ppm. This was verified by several researchers from the Municipal Chemical Research Institute of Kassel, the Federal Research Institute in Wiesbaden and the Municipal Chemical Institute of Koblenz.

Because Odenthal and Wieneke's report and diagnosis were based on erroneous suppositions, they can hardly be used to support resistance to fluoridation in Germany.

Steinweg 6, Kassel, Germany

Hospital dental service

Providing dental care for the handicapped patient

Manual M. Album. *Am.J.Pub.Health* 50:1727-1730 Nov. 1960

The task of setting up a dental program under the auspices of a crippled children's society or a hospital group takes infinite patience and initiative on the part of the dentist. It must be coordinated to include all phases of civic need and community responsibility.

The first step is to evaluate the existing case load of patients in the area and their basic dental needs. The dentist then must explain to the parents how the dental program will influence the progress and prognosis of the child. A dentist should be made a member of the professional advisory committee. The local dental society should be informed of the program, as should the parent group affiliated with a children's society. Parents must be informed that no matter how severe the child's physical or mental handicap, the child can receive proper dental treatment. A good relationship between a parent group and the sponsors of a dental program will aid the dentist to equip a modern dental clinic.

The policy should be to encourage the families of handicapped patients to have the care provided by the family dentist if he already is treating the child satisfactorily. Where this is impossible, the child should be admitted to the dental clinic. Patients for the program will come not only from the program's own case load, but also from members of the local dental society. Patients may have to be scheduled on a one-day-a-week basis or on one evening a week. Auxiliary help can be obtained from volunteer agencies and also from the local dental hygienists' organizations.

The hospital program to provide dental care for the handicapped patient must be on a mutual assistance basis. The administrator and the surgeon-in-chief of the hospital must understand the dentist's need for operating room privileges. Unless the dentist is placed on an equal footing with the surgeon as to operating room privileges, there is no point in carrying out a definite hospital program. Definite time must be set aside in a hospital for the dental treatment of patients under general anesthesia. Dental patients must be assigned on a set schedule.

To cover the costs, the hospital must stand some or all of the expense. In Philadelphia, Blue Cross has agreed that when a handicapped child is involved, the subscriber is entitled to have all hospital costs covered on a semiprivate basis. The State of Pennsylvania has set up a program to help the hospitals recoup some of the losses involved in the hospital treatment of handicapped patients; under the program, the State Health Department pays $50 to the hospital for each patient seeking dental care. The Dental Health Department underwrites the tuition of a limited enrollment course on the subject of dentistry for the handicapped patient.

The local and state dental societies should establish subcommittees on the handicapped patient.

School of Dentistry, University of Pennsylvania, Philadelphia, Pa.

General

Dental treatment of rheumatic patients

A. G. Payer. *Zahnärztl.Welt & Reform* 61:649-650 Oct. 25, 1960

Patients affected with different types of rheumatism are seen frequently at the dental office. Either they require routine dental treatment or they were advised by a rheumatologist to have the teeth extracted which are suspected of harboring foci of infection.

Usually, the dentist takes a few roentgenograms, extracts the teeth involved in chronic periapical granuloma or abscess (which may or may not have caused acute rheumatic fever), and performs the indicated prosthetic and endodontic procedures. The patient then is referred back to the rheumatologist.

In recent literature there has been a tendency to discredit the possible relation between rheumatism and dental foci of infection, and dental treatment of rheumatic patients for foci of infection is inadequate. Careful investigation by the dentist is required to detect the focus which may be responsible for the rheumatic manifestations. Some patients have a specific vulnerability, hereditary or acquired, which predisposes them to rheumatic attacks.

For therapeutic anesthesia and diagnosis of focal infection of dental origin, Impletol (Bayer), a compound consisting of procaine and caffeine, in a 3.42 per cent solution, is used at the Dental Clinic of the Rheumatologic Hospital Szot, Héviz, Hungary.

The treatment depends on the severity of the rheumatic disease and the condition of teeth and gingiva. Extraction of septic teeth may produce bacteremia.

The day prior to extraction, Impletol treatment (between 0.2 and 2 cc. periarticularly, perineurally, periosteally or perivascularly injected) is initiated and continued for at least seven post-extraction days. The gingival sulci are cauterized immediately before extraction. Trauma is reduced to a minimum.

The question of whether or not it is advisable to preserve teeth which are suspected of causing rheumatic manifestations requires careful judgment. Nonvital teeth which show roentgenographic evidence of infection must be extracted. However, the condition of a nonvital tooth giving no roentgenographic signs of infection is difficult to evaluate. The possible presence of a focus should be further investigated by removing the filling and making a bacteriologic examination of the apical portion of the root canal.

The age of the patient will influence the decision about the type of dental treatment to be used, especially in borderline instances in which it is difficult to decide whether to extract suspected teeth or to preserve them. In children, adolescents and in the aged, the indication is toward preservation. In younger patients, the preserved teeth may function satisfactorily for many years; in older patients, the elimination of an uncertain septic focus has to be weighed against the possibility of surgical shock. In middle-aged patients, however, there is more indication for extraction of teeth suspected of being foci of infection, thereby causing or promoting rheumatic manifestations.

Dental Clinic, Rheumatologic Hospital Szot, Hélviz, Hungary

"Kibitzer" mouth mirror: the dentist's third hand

Georg J. Appenrodt. *D.Echo* 30:62 Sept. 1960

Unquestionably, the mouth mirror is the instrument most frequently used by the dentist during oral examinations and dental procedures. The mouth mirror is used to inspect intraoral regions not visible by direct observation. It reveals the presence of minute carious lesions, reflects light from extraoral sources to the tooth to be treated and also may be used to keep the tongue or cheeks away from the operating field.

However, the commonly used mirrors keep one of the hands continuously occupied. Therefore, this type of mouth mirror cannot be used for procedures requiring the use of both hands.

The author has developed a mouth mirror provided with a clamp, which replaces the handle, and can be fastened to the tooth adjacent to that in which the cavity is prepared. The surface of the mirror can be moved in all directions to obtain the most favorable position for indirect observation. The dentist's left hand can be used fully in all dental procedures. The intraoral region to be inspected remains unobstructed, even if the patient moves his head.

The new handleless mouth mirror, called "Kibitzer" (in German, *Kiebitz*) has been tested thoroughly in many dental clinics and private practices, and has been recommended highly by all investigators. The instrument now is produced in Germany and will be soon available in Austria, France, England, The Netherlands, the Scandinavian countries and the United States.

Parkstrasse 13, Delmenhorst/Oldenburg, Germany

Cleft lip and palate in Tasmania

B. K. Rank. *M.J. Australia* 2:681-689 Oct. 29, 1960

In the period from 1945 to 1957, one of every 600 children born alive in Tasmania had cleft lip, cleft palate, or both. This is the highest recorded incidence for a community of European stock.

Of the 160 children with cleft lip or cleft palate, 32.5 per cent had a family history of the anomaly. Of the 53 propositi with cleft palate alone, 16 (30.2 per cent) had at least one other congenital defect, notably mental disability (13.2 per cent).

Cleft lip and cleft palate are almost equally prevalent throughout all districts of Tasmania, and occur with the same frequency in rural and urban areas.

Examination of the hereditary basis of cleft lip leads to the conclusion that, contrary to the current view of Fogh-Andersen (1942), cleft lip with or without cleft palate is not occasioned in all instances by a genetic system independent of that producing cleft palate alone. However, it is true that at least two main genetic complexes are involved. One or more dominant autosomal genes of reduced manifestation probability are responsible in each instance.

A significant excess of children with cleft lip or cleft palate is born to mothers in the higher age groups; the effect of birth rank probably is related to this.

University of Melbourne, Melbourne, Australia

Radiation hazard: the danger to mind

H. J. Melching. *CIBA Symp.* 8:151-159 Oct. 1960

The ever-increasing amount of radioactive rays to which mankind is exposed requires immediate answers to the questions: (1) how far have the effects of radiation on the human organism been explored, and (2) how far are the results of animal experiments applicable to man? No final pronouncement of the radiation hazard is possible before the link between basic radiobiologic research and clinical experience in man has been established.

Acute radiation damage—apart from the instances observed during World War II—is largely limited to the victims of accidents or of some acts of negligence. Because the number of such instances naturally is relatively small, the problem of exploring the mechanism of action and the clinical aspect of radioactivity is confined to basic experimental research which, however, provides a significant contribution to the knowledge of diagnostic and therapeutic application of ionizing radioactive rays.

In animal experiments, the major difficulty lies in the proper selection of suitable animals, that is, species whose organisms exhibit as many parallels as possible with that of man. The best results have been obtained with apes and pigs. Large-scale experiments, however, require considerable resources in personnel and material. Studies in larger animals will be possible only when serial investigations in the smaller species (mice, rats, guinea pigs, and so forth) have provided sufficient basic statistical information.

In man, the typical picture of acute radiation damage is marked by manifestations in the following four main regions: (1) the autonomic nervous system, (2) the hematopoietic organs; (3) the gastrointestinal tract, and (4) the reproductive organs.

Manifestations in the autonomic nervous system initially take the form of subjective symptoms

such as "radiation sickness" which occurs in response to relatively small doses. It has not been determined whether the central nervous system is involved in producing this sickness or whether it affects the course of the disease. Animal experiments, in which protective substances were used, seem to suggest that the central nervous system is involved, but the absence of conclusive clinical or experimental data makes it difficult to decide whether the central nervous system reacts in a specific or an unspecific manner to the effects of the radioactive rays.

Manifestations in the hematopoietic organs consist of severe damage to the cells and tissues, which are highly sensitive to radioactivity. The white blood count falls abruptly, proportionally to the degree of exposure, and infectious complications develop. The thrombocyte count also falls, but not to the same extent as the white cell count. Disturbances in the permeability of the walls of the blood vessels play an important part in causing postradiation hemorrhages.

The epithelium of the mucous membranes, especially of the small intestine, is as sensitive to ionizing radiation as is the hematopoietic system. Gastrointestinal manifestations, mainly in the form of diarrhea with varying degrees of hemorrhage, are the typical signs of acute radiation damage. In Hiroshima and Nagasaki, no definite relation between the severity of the gastrointestinal complications and the degree of exposure to the radioactive effects of the atomic bomb could be determined. Bacteriologic investigations excluded the possibility of an epidemic Salmonella infection. Pathologic-anatomic examinations of the victims of the Hiroshima and Nagasaki bombing revealed the presence of specific lesions resulting from radiation damage and of unspecific lesions probably caused by microorganisms in patients with a weakened resistance.

Permanent sterility, due to damage to the reproductive organs, was not found among the survivors, probably because the doses required to produce such an effect would have simultaneously caused the death of the victim. Spermatozoal depletion, however, was associated with the degree of exposure, attaining its peak about nine months later. The spermatocytes and spermatogone are evidently more sensitive to radiation than the mature sperms. The incidence of premature birth and postradiation abortion was profoundly increased.

The results of animal experiments and clinical experience reveal that the following conditions can be considered (with varying degree of probability) as delayed effects of irradiation: (1) hematologic lesions; (2) tumors; (3) vascular disorders; (4) cataracts; (5) fetal malformations; (6) shortened life expectancy, and (7) genetic changes. In the survivors at Hiroshima and Nagasaki, the incidence of anemia, leukemia, hepatitis and malignancy was significantly increased.

The concept that the effect of radioactive rays on the human organism tends to shorten life has found wide acceptance. However, it is impossible to ignore the existence of certain similarities between the manifestations of radiation damage and those of the physiologic aging process. The possibility that delayed effects are not specifically caused by diagnostic or therapeutic radiation but are the results of premature aging cannot be disregarded. It is almost impossible to determine objectively at what stage the aging process sets in, because the only tangible criterion is the reduced span of life.

Radiologic Institute of the University of Freiburg/Breisgau, Germany

Physicians vs. doctor vs. professor

R. E. Stowell. *Bul.Col.Am.Pathologists* 14:155 Dec. 1960

The term doctor, derived from the Latin word for teacher, has many meanings. Dictionary definitions include: (1) a teacher, a learned man; (2) an advanced academic title; (3) a licensed practitioner of medicine, and (4) a wizard or medicine man in a savage tribe.

In many countries, the practitioner of medicine has a title equivalent to that of physician or licentiate to practice, and the academic degree Doctor of Medicine is awarded to a select few after several years of advanced academic studies beyond those required to practice medicine. Yet, many state licensing boards now refuse to recognize graduates of foreign schools of highest caliber whose degree of Doctor of Medicine is the approximate equivalent of a combined M.D. and Ph.D. in this country. Some organized medical

groups are bringing increasing pressure to discourage holders of doctorate degrees in fields other than medicine from using the title of doctor. Dentists certainly are not impressed by the reference to "doctors and dentists." Some physical scientists retaliate with "Is he a physician or a scientist?"

As physicians, we should recognize that in many other fields besides medicine, academic degrees of doctor are given, and that we should extend to the holders of these degrees the same courtesy of title which we expect for our own. Regardless of the extent to which we practice, investigate or instruct, we should conduct ourselves as learned men, teachers and scientists in the highest tradition of the academic title of doctor.

Armed Forces Institute of Pathology, Washington 25, D.C.

Homebound dental care

Pennsylvania D.J. 27:6-10 Nov. 1960

Ambulant patients with various types of diseases have no problem getting to a dental office. The nonambulant chronic disease patient in general hospitals may be provided with complete dental service. However, the greatest number of patients with chronic disorders are homebound; it is these patients who most often are neglected so far as dental service is concerned.

The Council on Dental Health of the Philadelphia County Dental Society has undertaken a pilot study of this vital community health problem. The council sought data on the nature and extent of the dental needs of homebound patients; the extent of dental services which can be offered to this group; the effects of improved dental health on the general health of chronically ill homebound patients and the type of equipment most suitable for home dental examination and treatment. The council also has sought to train dentists and dental students to participate in home dental care.

A subcommittee of the council prepared light, portable dental equipment, consisting of a headrest to be placed either on back of a bed or a chair, an electric engine, a headlight, tray, forceps, restorative materials, and adequate hand instruments. Purchase of this equipment was financed by the Women's Auxiliary of the Philadelphia County Dental Society. The equipment, carried in two containers, weighs about 40 pounds.

Early in 1958 members of the society were informed of the project and asked to volunteer their services. They were offered use of the portable equipment and were asked to work on referred patients on a fee for service basis, or to donate their time and services for homebound indigent patients.

The first response was gratifying, but in time the council realized its approach was unrealistic, because too much time was consumed in travel to the patient and return of the equipment to the central office after each visit. The council concluded that it would be more practical to staff the program on a fee for service basis. In 1959 a member of the society agreed to complete the clinical aspects of the study on such a basis.

Among agencies referring patients were the Visiting Nurses Association of Philadelphia and the Muscular Dystrophy Association. Even though medical clearance is given on the referral forms, a brief history is taken prior to operative dental procedures, with emphasis on allergies, anticoagulant therapy, use of drugs such as corticosteroids, and diabetes and tuberculosis.

Most of the clinical work for this study has been done by Joseph Musitano. He reports that on every occasion he has been received most courteously by the patient and his family, who are grateful for the service.

Of 35 homebound patients treated, none had received dental care in the past five years. There were 17 men and 18 women patients. Nine were less than 20 years old, six were between 40 and 49 years old, seven were between 50 and 59 years old, and ten were between 60 and 70 years old.

The medical diagnoses were: cerebral accident, 5; central nervous system disorder, 2; cirrhosis of liver, 1; cardiac condition, 2; fractured hip, 2; multiple sclerosis, 6; muscular dystrophy, 9; Parkinson's disease, 2; paraplegia, 1; rheumatoid arthritis, 1, and spastic paralysis, 1.

In 171 visits to homebound patients, the following dental services were performed: prophylaxis, 35; amalgam restorations, 60; silicate restorations, 20; extractions, 45; alveolectomy, 1;

complete denture service, 3; partial denture service, 4, and periodontal treatment, 3.

The Council on Dental Health now knows the types of handicaps apt to be encountered in homebound patients, and how to provide dental service to these patients. It has been established that all operations necessary for the relief of dental pain, improvement of general oral health, and the provision of dentures can be performed in the home. It has been proven that organized dentistry can cope with the problems of community dental health.

Council on Dental Health, Philadelphia County Dental Society, Philadelphia, Pa.

Why are research grant applications disapproved?

Ernest M. Allen. *Science* 132:1532-1534 Nov. 25, 1960

Of nearly 6,000 research grant applications received by the National Institutes of Health in the year ending June 30, 1959, the 30-odd advisory boards of scientists disapproved about 2,000 applications.

A sample of 605 disapproved applications showed that their shortcomings had to do with either (1) the conception of the research problems, (2) the proposed route of approach toward their solution, (3) the competencies to be mobilized toward prosecution of the research, or (4) miscellaneous other matters.

The percentage frequency of applications (in the 605 applications) in which a given shortcoming was found is reported for each of 26 shortcomings commonly found. The percentages corresponding to the four main classes of shortcomings add up to more than 100 per cent, as do those shortcomings within any of the four groups, because a given research proposal may have more than one adverse characteristic.

Of the 605 applications, 58 per cent had a shortcoming in Class I (problem), 73 per cent in Class II (approach), 55 per cent in Class III (man), and 16 per cent in Class IV (other reasons).

The most common shortcomings, and the percentage of 605 applications falling in each, were as follows:

Problem is of insufficient importance or is unlikely to produce any new or useful information (33.1 per cent).

Proposed tests, or methods, or scientific procedures are unsuited to the stated objective (34.7 per cent).

Description of the approach is too nebulous, diffuse, and lacking in clarity to permit adequate evaluation (28.8 per cent).

The over-all design of the study has not been thought out carefully (14.7 per cent).

The investigator does not have adequate experience or training, or both, for this research (32.6 per cent).

The investigator appears to be unfamiliar with recent pertinent literature or methods, or both (13.7 per cent).

The investigator's previously published work in this field does not inspire confidence (12.6 per cent).

The requirements for equipment or personnel, or both, are unrealistic (10.1 per cent).

Division of Research Grants, National Institutes of Health, Bethesda, Md.

New equipment

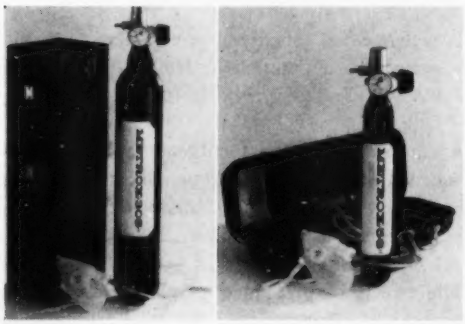
The information reported here is obtained from manufacturers. Dental Abstracts *does not assume responsibility for the accuracy of the information. The interested reader may direct his inquiry to the manufacturer.*

The "Alston" universal air turbine handpiece with miniature head for S.S. White or Ritter Borden Airotor has a turbine speed of 250,000 to 300,000 rpm. The handpiece can be attached the same as the original handpiece. The adjustable, detachable head can be set at any angle. An atomized coolant spray is directed onto the cutting surface. *Union Broach Co., Inc., 80-02 Fifty-first Ave., Elmhurst 73, N.Y.*

Two electric air purifiers are designed to clean the air of dust, lint and pollen, and to remove odors, smoke and grease. The "Hy-Genic Aire" purifiers are upright models, 6¾ inches in diameter and 16 inches tall. Each purifier has a 6-foot electric cord with switch, electric fan, activated charcoal wafer, circular activator and a container of Hy-Genic Aire chemical. *Hy-Genic Products Corp., 8030 W. 47th St., P.O. Box 37, Lyons, Ill.*

The "Ultracleaner" dental unit no. 60 is described as a sonic energy cleaner designed for the dentist and dental laboratory. It removes soil from all appliances, instruments and dentures within a minute or two. No special wiring or plumbing is required. The cleaner is operated by an on-off switch and a single dial for frequency tuning. The tank measures six inches square and holds 2¾ quarts of solution. *Lawrence Mfg. Corp., 922 McCarter Highway, Newark 2, N.J.*

"Metrox" portable oxygen kits are available in two sizes. Model 56 comes in a plastic carrying case 16⅝ inches long and weighs four pounds. Model 305 comes in a leatherette case 24½ inches long and weighs 10 pounds 11 ounces. Each kit includes carrying case, filled oxygen tank for emergency treatment, valve and cylinder assembly, recharging attachment, wrench, hose assembly and flexible plastic mask. For illustrated brochure write *A.I.R. Corp., Oakland International Airport, Oakland, Calif.*



Doctoral and Masters' dissertations

In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.

Tissue healing following gingivectomies. *William R. Hernandez. 1961.* M.S. *Baylor University.*

Transplantation of Walker 256 carcinosarcoma cells in the pulp and periodontium. *Donald Eugene Ore. 1960.* M.S. *University of Illinois.*

Clinical evaluation of "Gum-Ox" as a plaque and calculus preventive. *Tore Ørnulf Kristoffersen. 1960.* M.S. *University of Michigan.*

A clinical evaluation of the vertical technic of toothbrushing with an adjustable head toothbrush. *Richard Albert Shick. 1960.* M.S. *University of Michigan.*

Interrelated effects of diabetes mellitus, arteriosclerosis, and calculus on loss of alveolar bone. *Richard Stanley Mackenzie. 1960.* M.S. *University of Michigan.*

Prevalence and severity of periodontal disease in a sample of a population. *Homer C. Jamison. 1960.* M.S. *University of Michigan.*

A comparison of the roentgenographic appearance with the actual penetration of carious lesions in primary teeth. *Michael Charles McCann. 1961.* M.S. *University of Nebraska.*

The effects of prolonged psychic stress on the dental caries experience of the desalivated albino rat. *Robert Rowe Brady. 1961.* M.S. *University of Nebraska.*

Clinical study of intraoral carcinoma and consideration of etiological factors. *T. S. Wittman. 1959.* M.D.S. *University of Pennsylvania.*

Comparison of thiopental sodium, methitural sodium and methohexital sodium in oral surgery patients. *C. H. Redish. 1959.* M.D.S. *University of Pennsylvania.*

Study of the head and face of the American Negro child. *L. A. Altemus. 1959.* D.D.SC. *University of Pennsylvania.*

Postoperative edema and its reduction by trypsin. *P. B. Schneider. 1960.* M.D.S. *University of Pennsylvania.*

Carcinoma of the mouth and oropharynx; an analysis of 334 cases. *D. S. Topazian. 1960.* M.D.S. *University of Pennsylvania.*

Preoperative use of hypnosis as an adjunct to general anesthesia. *Benjamin Chan. 1961.* M.D.S. *University of Pennsylvania.*

Comparative study of the diagnostic value of the roentgenographic techniques of the temporomandibular articulation. *G. R. Lewis. 1961.* M.D.S. *University of Pennsylvania.*

Clinical evaluation of dexamethasone in oral surgery. *W. B. Linenberg. 1961.* M.D.S. *University of Pennsylvania.*

A quantitative study of the alveolar bone response to molar extrusion induced by removal of antagonists in the rat. *Joseph Samuel Azar. 1960.* M.S. *University of Pittsburgh.*

Cooperation between otorhinolaryngologist, dentist and oral surgeon: case histories of the department of Otorhinolaryngology of the Municipal Hospital in Mannheim, Germany, from 1949 to 1959 (Die Zusammenarbeit des Oto-Rhino-Laryngologen mit dem Zahnarzt und Kieferchirurgen: nachgewiesen am Krankengut der Hals-Nasen-Oren-Abteilung der Städtischen Krankenanstalten Mannheim von 1949 zu 1959. *Erika Kopf. 1960.* DR.MED.DENT. *University of Heidelberg, Germany.*

Cholesterol content in odontogenic cysts of the jaws (Beitrag zum Cholesteringehalt in odontogenen Kiefercysten). *Arno Marquetand. 1960.* DR.MED.DENT. *University of Heidelberg, Germany.*

Tests for dimensional stability, clinical and practical investigations of the self-curing acrylic resin Palavit G: its applicability as a material for cast models (Masstechnische und klinisch-praktische Untersuchungen des Autopolymerisate Palavit G: seine Verwendbarkeit als Gussmodellwerkstoff). *Joachim Tränkmann. 1960.* DR.MED.DENT. *University of Heidelberg, Germany.*

Effects of silver content grain-size fraction in amalgam fillings on the marginal sealing of amalgam restorations (Über den Einfluss von Silbergehalt und Korngrösse der Amalgamfüllungen auf den Randschluss der Amalgamfüllungen). *Miklos von Verbowszky. 1960.* DR.MED.DENT. *University of Mainz, Germany.*

Experimental study concerning the fluctuations of cholesterol level in the blood plasma with α-cholestanol application. *Takeshi Mori. 1961.* D.D.SC. *Nihon University.*

Experimental study on the penetration of mercury into dental tissues after amalgam fillings, using Hg^{203} as a tracer. *Chitoshi Itai. 1961.* D.D.SC. *Nihon University.*

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